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SURVEY OF BLOOD GROUPING AND Rh FACTOR IN THE ESKIMOS OF THE EASTERN ARCTIC, 1945

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Toronto

IN 1944 it was my privilege to join the annual Eastern Arctic Patrol as surgeon, from Churchill, Man., back to Montreal. Having agreed to return on the same portion of the Patrol in 1945 and being familiar with the work involved, I was better qualified to attempt this survey on the second voyage. There are no records of a similar survey having been done in this area, though Heinbecker and Pauli¹ of the Putnam Expedition of 1926-27 conducted a blood grouping survey of the North Greenland and Baffin Island Eskimos. Comparison of their findings with ours will be referred to later. I was fortunate in having as my assistant Mr. George Medhurst, chief technician of the clinical laboratory of Wellesley Hospital, Toronto, without whom this work could not have been attempted.

D. Jenness of the National Museum of Canada in Ottawa has this to say:

"The origin of the Eskimos remains a mystery, despite the intensive researches of the last fifty years. We are reasonably sure that the natives who today frequent the shores of the Eastern Arctic once dwelt on the Northern Plains west of Hudson's Bay and did not move out to the coast until about the 14th century A.D. From Newfoundland north to Ellesmere Island, however, we have found the remains of an earlier and in some ways more primitive Eskimo group, while still a third branch of the race has left the ruins of its habitations from north Alaska clear across Arctic America to Hudson's Strait and Greenland.

Preceding both these prehistoric groups, yet not directly ancestral to either of them, was a group that flourished around the Behring Sea in the early centuries of the Christian Era, when it attained a level of culture unsurpassed and perhaps unequalled by any of its successors. Further than this we cannot penetrate. Several writers, observing the resemblances between certain bone and stone implements used by the Eskimos and some left by 'Magdalenian' man in France and other countries, believe that the Eskimos are the direct descendants of a late Palaeolithic people who once inhabited parts of Europe: but so far we have found no remains that would bridge the gap of 7,000 or 10,000

years between that period and our own, nor any traces of a migration across Siberia to the American Arctic. Quite recently too, we have learned that the Eskimos are not an unmixed race, but that only certain groups are physically peculiar, whereas others are hardly distinguishable from the Chipewyan Indians of Lakes Athabaska and Great Slave, and closely resemble also the Cree and other Indians who roamed over Eastern Canada before the coming of the white man. So, as often, a problem that once seemed simple turns out to be very complex; and no scientist familiar with its complexity would feel surprised if the same strain of blood as flows in European veins should prove to be present, albeit in a strongly diluted form, among the aborigines of our far north."

Taking Jenness literally, it would appear that the more modern scientific blood investigations may help to solve the mystery of Eskimo origin. As will be seen later, the Eskimo evidently does not show the characteristic blood grouping of the Mongol race.

Naturally there has been contact with the white race as long as our known records of exploration, dating back to the early Scandinavian expeditions. However, nearer to our own time, we have the Scottish whalers of the



[Dept. of Mines and Resources]
Fig. 1

last century making voyages to Baffin Island and as far north as Dundas Harbour. It is interesting to record here that the first physician to have landed on Baffin Island was the late Sir Arthur Conan Doyle, who accompanied one of these whaling expeditions soon after his graduation. Whalers, traders, scientists and missionaries have all visited and resided in the area under review. In 1922 the Department of the Interior of Canada, now the Department of Mines and Resources, inaugurated an annual expedition known as the Eastern Arctic Patrol. Through this Patrol the whole area is administered and supervised.

This survey covers the most northerly inhabited section of the Eastern Arctic and principally Baffin Island. Hence, these Eskimos are the farthest removed from the white race in distance, but in their contact with whites the Eskimos of West Boothia Peninsula and Queen Maud Gulf are probably more isolated. They do not live at these posts, but many of them journey in at "ship time", when the Hudson's Bay Company steamer, *R.M.S. Nascopie*, is due to arrive.

The Eskimos are nomadic people living in camps of about 30 to 40 people, changing their locations as the need arises to find new hunting grounds. They have no surnames and often the given names are descriptive; in the Ennuit language, *e.g.*, *Ookvatwaicheak* — the only one; *Kohngasereektook* — big neck; *Amagooalik* — like a wolf. Again, those Eskimos who have had Christian baptism are given another name, sometimes English, sometimes French. To add to the confusion, the practice of adoption is widespread among these people. In one section I found it the custom for the grandparents to adopt the first male grandchild; if a couple have a second child before the first can walk, the difficulty of transporting the two infants leads to the older child being adopted by another family or by the grandparents; a childless couple will adopt a child or children of someone else.

In order to keep track of this mobile population with its mingled family groups, the Department of Mines and Resources solved the problem in the census of 1941 by using the Army method of numbering. This provides a permanent registration record in Ottawa. Thus there is a field for scientific endeavour, which for the study of a group of people in continuity and living under natural conditions in their

native habitat, is unsurpassed for future biochemical and serological investigations. A copy of all work done in this survey is on file in the Department at Ottawa.

All the sera for determining the Rh factor, the M and N and standard blood groupings were taken from Toronto to Churchill in the August heat in thermos jars. With a stopover at Winnipeg, it took nearly a week to reach Churchill and during this period the sera were kept at a low temperature by cooling the jars with ice water every 24 hours. Once on board ship, there was no difficulty in keeping the sera cool in the Arctic latitudes.

There was no discrimination in selecting individuals for testing. All available Eskimos were taken, either those apparently of pure blood or the mixed breeds. One hundred and forty samples of blood were taken for Wassermann, Widal and blood chemistry tests and 369 samples for routine and M and N grouping and for the determination of the Rh factor. Unfortunately the M and N sera were inactive, hence the results of these tests cannot be given. At Chesterfield Inlet, N.W.T. where the Roman Catholic Hospital of Ste. Therese is located, 97 Eskimos were tested. At the Anglican St. Luke's Hospital, Pangnirtung, 84 were tested. Our stay at each of these places was more prolonged and the work could be done in the hospitals. At all other ports of call the samples were collected on shore, varying in number from 26 to 56 at a post, taken on board and the work completed there.

For the Rh factor we used one drop of fresh blood to 2 c.c. of normal saline. Of this fresh blood suspension, one drop was mixed with an equal sized drop of the Rh serum. This was incubated for one hour at 36° C. Not having a thermostatically controlled water-bath, we used a large fish kettle, controlling the temperature between 37 and 45 degrees by adding hot water. The blood suspension mixture was kept in the bath for approximately 1 to 1½ hours. It was then read under the microscope.

For the standard blood grouping, we used the usual slide method, with Jansky and Landsteiner recordings.

There are about 45,000 Eskimos in the world, of which approximately 7,700 are in Canada. In the area which we covered, the most northerly section of the Eastern Arctic, the population tributary to the 7 ports of call is 1,417. Therefore, the 369 reported in this survey represents

over one-quarter of the population in the area covered. This fraction and the area involved represents a comprehensive and fairly complete survey.

TABLE I.
CHESTERFIELD INLET

No. tested	O	A	B	AB	Rh pos.	Rh. neg.
97.....	38	57	0	2	97	0

In this section the A's predominated. Here were found two of the rarer type AB, occurring in a mother and her son.

Father No. 4776 Type A
Mother No. 4777 Type AB
1st son No. 7029 Type A
Twins (one died)
Survivor No. 7065 Type AB

TABLE III.
POND INLET

No. tested	O	A	B	AB	Rh pos.	Rh neg.
56.....	33	22	1	0	56	0

Here was a slight predominance of type O, with one type B found. The type B was a young girl Koonoo, No. 6010.

Father..... No. 6008 group O
Mother..... No. 6009 group O
Brother (or rather half-brother) No. 6011 group O
Daughter..... No. 6010 group B

A photograph of the girl and her parents is reproduced in Fig. 2, in which it is obvious that the girl has white blood. The father is a Mongolian type and the mother more Indian.



Fig. 2 Photographs by A. H. Tweedle, Hamilton, Ont.

From information available and from the mother's appearance, it was definitely established that she was of mixed blood. The surviving twin No. 7065 had fair colouring, resembling the mother.

TABLE II.
SOUTHAMPTON ISLAND

No. tested	O	A	B	AB	Rh pos.	Rh neg.
36.....	11	25	0	0	36	0

Here again the A's predominate. None of the rarer types B or AB were encountered. On board ship 6 Eskimo passengers were tested and all were type O and Rh positive.

Heinbecker and Pauli in 1927 reported the results of grouping a small series at this same station of Pond Inlet. It is interesting to note here the comparison between their findings and ours, as follows:

	Heinbecker and Pauli 1927	Jordan 1945
Total grouped.....	28	56
O.....	15	33
A.....	12	22
B.....	0	1
AB.....	1	0

Referring to the one AB group found in 1927, the Department's system of numbering Eskimos was not then in force. Had it been, it would

have enabled us in 1945 to attempt to trace this one and follow through the family incidence.

TABLE IV.
FORT ROSS

No. tested	O	A	B	AB	Rh pos.	Rh neg.
26.....	5	21	0	0	26	0

Here the A's predominate, which may be accounted for by the fact that of the 26 people tested, 14 belong to one family tree, that is, grandparents, parents and children. Of the remaining 12, five were group O and seven group A. None of the rarer groups B or AB were found.



Fig. 3.—Group AB.

TABLE V.
ARCTIC BAY

No. tested	O	A	B	AB	Rh pos.	Rh neg.
40.....	18	15	5	2	40	0

Here A's and O's were fairly evenly distributed. The 5 B and 2 AB groups are all in one family.

Father	No. 6387	Group AB
Mother	No. 6388	Group AB
Children	No. 6389	All Group B
	No. 6390	
	No. 6391	
	No. 12605	
	No. 12632	

Upon investigation it was found that each of the parents has a definite infiltration of white blood. The husband is one of the outstanding leaders and hunters of the district, see Fig. 3.

TABLE VI.
RIVER CLYDE

No. tested	O	A	B	AB	Rh pos.	Rh neg.
24.....	13	11	0	0	21	3

At this post the first Rh negatives were found. Of these three, two were mother and child:

Mother (unmarried) No. 6255, mixed blood, group O. Child No. 7293, group O, acknowledged to have a white father, therefore the child is three-quarters white. Their photographs are reproduced in Fig. 4.

The third Rh negative, No. 6214, Jacobi, group O, 8-year old male. His mother is Rh positive and group A. Because of the limited



Fig. 4.—Rh negative.

time of the ship at this port, it was not possible to trace the genealogy of this first male Rh negative encountered. The case is worthy of further investigation.

TABLE VII.
PANGNIRTUNG

No. tested	O	A	B	AB	Rh pos.	Rh neg.
84.....	34	44	4	2	82	2

Details of those in groups B and AB:

1. No. 5273, Martha, 21 years; her mother No. 5711 is half white, both are group B. Maternal grandfather a Frenchman, maternal grandmother Eskimo.

2. No. 5985, Noadla, male, group B. Nothing is known of his family history.

3. No. 5595, Ananil, male, group B. Nothing is known of his family, but he comes from a

district which has been frequently inhabited by white people for some generations.

4. No. 7134, Enoch, group B. His mother No. 5795, Malaya, is group A. His father No. 5794, Newtarala, is group AB; his paternal grandmother No. 5834 is also group AB. (These were the two AB's found at Pangnirtung). Nothing further is known of the family history.

Details of the two Rh negative cases:

1. No. 5502, Eeve, a 16 year old girl. On enquiry it was found that this girl had one Spanish and one Scottish grandfather. Both grandmothers were Eskimos. She is group A.

2. No. 5874, 19 years, female, group A. Family history could not be traced, her father dead, her mother alive but blind (not tested). It was not known if there was any white blood in this case. She had a sister No. 5860 who was Rh positive

and also group A. Her husband was also Rh positive.

SUMMARY

1. The comparison of blood groupings between the Eskimos and the Chinese is interesting. The Eskimos do not show the high percentage of group B and AB that is found in Mongolian peoples.

2. As shown by data and illustrations, all of the B and AB groups occurred in the mixed breeds.

3. All the negative Rh factors, excepting the one which lack of time did not permit further genealogical tracing, occurred in those Eskimos of mixed blood.

A survey of this type in such a remote area would have been impossible without the co-operation of many individuals and organizations. I am indebted to the



Fig. 5



Fig. 6

Figs. 5 and 6.—Mother and children, types O and A, no irregulars.

TABLE VIII.
DISTRIBUTION OF THE A, B, AND RH FACTORS IN DIFFERENT RACES

	No. tested	O	% of Group		AB	Rh factor No. tested	Rh neg. %
			A	B			
White.....	1,000 (a)	47.7	40.8	11.6	2.9	334 (e)	15.0
Negroes (U.S.).....	500 (b)	47.0	28.0	20.0	5.0	377 (f)	5.5
Indians (U.S.).....	1,372 (c)	75.0	14.0	7.2	3.6	120 (g)	0.8
Chinese.....	4,092 (d)	37.0	30.0	25.0	8.0	150 (h)	0.7
Eskimos, Eastern Arctic.....	369	43.0	53.0	2.7	1.6	339	1.03

- (a) Erb, Doyle and Heal.²
(b) Snyder and Wiener.³
(c) and (d) combined from Wiener.
(e) Levine, Burnham, Katzin and Vogel.⁴
(f) Levine, Landsteiner and Wiener.⁵
(g) Landsteiner, Wiener and Matson.⁶
(h) Levine and Wong.⁷

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CALCIFIED GALL BLADDER*

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SOME gall bladders retain in their walls amounts of calcium and thus acquire unusual properties of toughness, colour and sound effect to percussion. Due to these properties the condition has been designated as petrified, ossified, porcelain or china gall bladder. Since it pertains to a special type of inflammatory evolution, the name should be more explicit. It would be preferable to speak of the process as *calcifying cholecystitis*, *cholecystopathia chronica calcarea* or simply, *calcified gall bladder*.

In the diagnosis, the roentgenologist plays the feature part, for he alone can demonstrate the lime infiltration without opening the abdomen.

Before discussing the various aspects of the calcified gall bladder, the most typical of our

four cases is presented so that the characters of the disease may be recognized more readily.

CASE REPORT

M.F. a French Canadian married woman, aged 67, was admitted to the Hôtel-Dieu, of Montreal, under the care of Dr. B. Dandurand, on October 5, 1943, with vomiting and acute pain in the right upper quadrant. She had been hospitalized 18 years previously for the same symptoms, which rapidly disappeared following treatment. In April 1943, the complaint reappeared and from that date to September recurred at regular three-week intervals, following which the syndrome increased in severity and frequency, with weekly attacks necessitating recourse to narcotics. During the six-month period, the patient, for fear of recurrence of symptoms, abstained from certain foods, especially fats. This resulted in a loss of weight of about 15 pounds.

The physical examination was uninformative, except for tenderness to pressure in the right subcostal area. The gall bladder was not definitely palpable. Temperature and pulse were normal. The blood pressure was 160/80. The hippuric acid determination in the blood showed 0.40 gr. per 100 c.c. on October 6; 0.61 gr. on October 13. Other laboratory tests were negative.

RADIOLOGICAL FINDINGS

1. *Without the dye.*—Previous to the intake of any iodized substance, the radiograms revealed a large oval

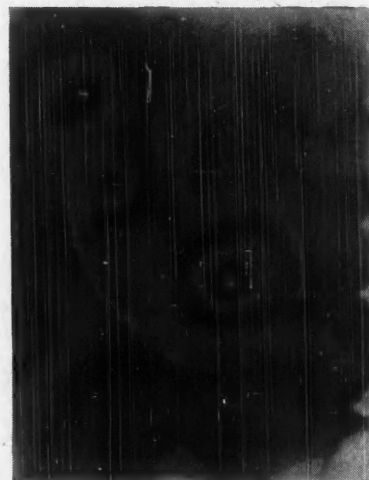


Fig. 1.—Radiogram of the gall bladder without dye.



Fig. 2.—Radiogram of the gall bladder after removal. The translucent lines indicate where a specimen has been taken for microscopic study.

* Read before the Canadian Association of Radiologists, Montreal, January, 1945.

shadow situated below the outline of the liver, at the angle formed by the spine and the right iliac crest. It measured about 7 cm. in length and 4 cm. in width. The opacity was not uniform. The edge was very dense, forming a thin shell-like rim, more sharply defined on the outside. The top edge of the ovoid remained open on account of incomplete calcification at that point. Within the border the shadow was faint and mottled, showing some mobility with change of posture of the patient from the upright to the recumbent position, also when pressure was applied under fluoroscopy.

2. *With the dye.*—The oral administration of two doses of 3 grams each of tetraiodophthalein, after 20 and 15 hours respectively, resulted in no change in shape and density of the above described image.

The diagnosis was calcifying cholecystitis.

The patient was operated on by Dr. Paul Marchildon on October 15, 1943. An uneventful recovery followed. The patient left the Hôtel-Dieu three weeks later.

PATHOLOGICAL FINDINGS

The specimen was examined by Dr. J.-L. Riopelle and the following findings were noted:

Gross pathology.—The gall bladder measured 8 cm. in length and 4 cm. in diameter. Although it was opened and emptied in the operating room, it did not collapse and the viscus retained its contour. The wall, 2 to 3 mm. thick, was hard, rigid and porcelain-like.

Microscopic pathology.—Normal structures were lost. The internal surface showed complete lack of mucosal membrane. The wall consisted of connective tissue, much striated, very poor in cells but rich in collagen substance. The dominating feature was an extensive infiltration of calcium which was distributed in large and small plates joined together or isolated. The lime streaks were chiefly noticeable in the internal layers. The periphery resembled scar tissue; it showed, here and there, masses of interrupted blood vessels, some lymphoid formation and arterial ramifications.

Diagnosis.—Calcifying cholecystitis.

HISTORICAL

According to Chiray and Pavel reference to calcification of the gall bladder dates back to 1797 with Grandchamp. During the last century, observations have been few and consisted mostly of autopsy discoveries. During the past three or four decades, improvements in roentgen diagnosis, the more frequent acceptance of cholecystectomy as well as the founding of numerous laboratories of pathology, have had some bearing on the reported increase in incidence of calcified gall bladder. Still, its frequency remains low. Kirklin, at the Mayo Clinic, has noticed the condition in only four of the 5,826 cholecystectomized patients in their records.

Professors Masson and Riopelle have recorded but one calcareous degeneration in their examination of the last 1,253 gall bladders removed at the Hôtel-Dieu, being in fact the case above described.

In more than 6,000 cholecystographies performed since 1938, on four occasions only has the diagnosis of calcified gall bladder been

made by the author from radiological findings. To date, there are only two cases proved in our series by operation, one of which is presently reported. A review of the literature by Russum and Hill, in 1935, brought to 30 the published cases, including three of their own. Twelve others have been recorded since, thus bringing the total to 42, and to 45 when our own are included. These figures are far from being a complete picture, since roentgenologists, surgeons and pathologists do not publish all their cases.

AGE AND SEX INCIDENCE

Chiray and Pavel, reviewing 20 published cases, remark that 14 are 70 years old and over. However, Fabre found calcification of the gall bladder in a person forty years of age and our patients were 32, 67 and 78 respectively. According to Chiray and Pavel, females are afflicted more frequently, in the ratio of 15 to 5. In our limited statistics, there were two females and one male.

MORBID ANATOMY

Calcified gall bladders are usually large and are of the hydropic type; occasionally they may be small, retracted and of the sclero-atrophic type. The lime impregnation either spreads uniformly or by plaques varying in thickness. The degree of infiltration determines the resistance to pressure and to the knife when cut. The colour may be reddish, bluish yellow or a combination of these. The sensation to touch is that of cardboard, celluloid or crackling egg shell (Gurd). According to chemical analysis by Philip and Maison, calcium phosphate predominates in the infiltrating material, with only traces of oxalate. Most commonly the cystic duct is obstructed by a stone or by the thickening of its walls. The contents of the gall bladder vary. There may be bile and mucus more or less combined with cholesterin and amorphous lime. Very frequently there are calculi.

On microscopic examination, the different coats of the normal gall bladder are no longer recognizable. The mucosa is reduced to a few cellular traces; the sub-mucosa and the muscularis are fused in one layer, greatly deprived of cells and invaded by hyaline substances, strongly acidophile (Chiray), giving a cartilaginous aspect. In these chondroid zones, calcium deposits are found in separate or con-

fluent patches. The serous membrane is usually free of petrification but it seldom escapes marked fibro-plastic reactions.

Calcification of the gall bladder seems of little interest to pathologists. They look upon it only as a local expression of a phenomenon common to all fibrotic tissues capable of storing calcium which undergo chondroid and osteoid changes under the influence of a prolonged low-grade inflammation. Consequently, if the condition does not reach extraordinary proportions, it remains of no special interest and does not make the headlines of pathological reports.

Such an attitude and the fact that pathologists commonly examine but a fragment taken at random in the bladder wall, explain to some extent the smaller number of cases of calcified cholecystitis which are officially classified amongst the large number of gall bladders removed. If the pathologist may be excused for his lack of interest in a condition which he likely considers of mere academic importance, the clinician and the radiologist, on the other hand, cannot ignore it in view of their responsibilities for its diagnosis and treatment.

PATHOGENESIS

This may be considered under two theories: mechanical and infectious.

The mechanical theory supposes a compression determined by the bladder content (calculus, hydrops) hence slowing of the blood circulation in the walls, degeneration, calcium sedimentation. The infectious theory which is accepted by a larger group of pathologists, maintains that calcification is the end-result of chronic inflammation which evolves without violent destruction, obstructing the lymph vessels, transforming the tissues and interfering with the elimination of suppurative products and, finally, retaining these with their calcium contents (Chiray and Pavel).

Symptoms.—No pathognomonic symptom or sign differentiates the porcelain gall bladder from other forms of chronic cholecystopathies. The disease may progress so insidiously as to remain latent, and eventual manifestations may be those which are familiar features of non-calculous chronic cholecystitis such as dyspepsia, intestinal disturbances, local and reflex pain but no jaundice. The four patients in

whom I found calcification of the gall bladder had symptoms and were referred specifically for cholecystography by the attending physician.

On physical examination, the gall bladder may be palpated if it is of sufficient size and the abdominal wall is thin and compressible. It is commonly painless.

ROENTGEN DIAGNOSIS

Cholecystography with iodine substances is, as a rule, useless, since the cystic canal is commonly obstructed and the mucosa always destroyed, rendering both penetration and concentration impossible. Moreover, the richness in calcium permits the spontaneous visualization of the porcelain gall bladder on the flat film.

Once seen in the hydropic form, the radiological picture is scarcely mistakable. The shadow has the shape, size and location of the viscus whether ovoid, piriform or round. In typical cases, the calcium is distributed unevenly in a most distinctive form. The edge is dense and sharply defined, forming a shell 1 to 2 mm. thick. This peripheral rim is due to a greater absorption of radiations in their course through the lateral portions. The ring is rarely closed. Mostly in all published cases and in perfect agreement with Hertz' observations, it remains open in some portions of its upper pole, thus suggesting that calcification extends from bottom to top.

However, in some instances, the opaque border may be incomplete, not only at the summit, but on other parts. For example, a case of our series showed a large circumferential defect in the mid-portion. This same case proved that the infundibulum and cystic duct may also be calcified since these segments gave rise to an unquestionable design on the films. With the opaque margin, the transparency is very irregular, the lime dispersion producing mottling or patches and giving at times a somewhat fish-scale like aspect.

The defect of the opaque border at the top and the mottled appearance of the inter-marginal space, identify the porcelain gall bladder. Nevertheless, some concretions of the region are likely to be mistaken, particularly in the determination of the viscus or tissues in which they are contained. Their differentiation and exact localization require the recourse to cavity-opacifying methods such as pyel-

ography, cholecystography, barium meals and enema. These technical methods include radiogram series under fluoroscopic control, in sagittal and angular directions, in expiration and inspiration, in erect and horizontal postures, with and without compression; briefly, all the possibilities of spot-film techniques.

When a large opaque calculus fills the viscus, there can be seen, almost always, concentric layers of stratified and calcified deposits about a nucleus which easily identifies it as cholelithiasis; if there be any cleavage in such a calculus, it will readily show up at its lateral edges, as well as at its upper and lower poles.

One frequently sees large pure cholesterin calculi, which, following dye impregnation, are encircled by opaque bile simulating a china gall bladder; but, in such conditions, the integrity of the ovoid form and the fine delimiting traits, as well as disappearance of the image following elimination of the iodized bile, will dispel any uncertainty.

Old abscesses of the hepatic parenchyma are differentiated, when it is necessary to do so, by cholecystography, and right renal concretions by means of opaque urography. Hydatid cysts are infrequent in our country; nevertheless, they may occasionally become calcified but are most frequently multiple. When one suspects echinococcic cyst, specific tests should be carried out to prove it. This list would not be complete if one failed to mention other causes of error such as costal cartilages, mesenteric lymph nodes, mucocele of the appendix with or without concretions.

The sclero-atrophic type of calcified gall bladder is not easily differentiated. The general form of the viscus is less defined and the volume small. The incrustation is never intense, being unevenly distributed and causing streaky imprints. When the opaque margin shows only along the bottom and the patient has been radiographed in the prone posture, diagnosis between a parietal wall calcification and calcium silt can be made, by having the patient radiographed in the recumbent lateral position. In the former state, the crescent-like form is persistent, whereas in the latter, it will lose the saucer-like shape. These differences are sometimes very fine; so that many radiologists who see in such minute details nothing but academic interest will be satisfied with George and Leonard to let it go as a common-

place cholelithiasis. It may be well to note that frequently in x-ray investigation, as well as at operation, calculi are found in calcified gall bladders.

CONCLUSION

Calcification of the gall bladder is a most interesting finding. Although rare, the condition offers such a definite radiological picture in most cases that once seen it can never be forgotten.

The viscus casts its shadow with an opaque and incomplete border while the centre is scale-like. The diagnosis rarely requires the use of opaque medium since the scout film reveals a characteristic image.

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It is as natural for the old to be prejudiced as for the young to be presumptuous; and in the change of centuries each generation has something to judge for itself.—Ruskin.

FIBROCYSTIC DISEASE OF THE PANCREAS IN INFANTS*

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THE following cases are being reported because they are illustrative of the syndrome due to fibrocystic disease of the pancreas which has been widely discussed in the recent paediatric and pathology journals. They present stimulating diagnosis problems and if diagnosed early, they not infrequently react well to treatment. The syndrome has been reported with increasing frequency but the increase in the number of cases noted is more apparent than real. A large number of the cases present predominant respiratory symptoms, and it is very likely that in the past, cases have died and been labeled pneumonia and bronchiolitis, and were primarily pancreatic, though not recognized.

In these cases there is an underlying cystic fibrosis of the pancreas which affects its enzymic activity but not the islets of Langerhans. There is, as a result, an output of pancreatic juice which is low or absent in enzymic ferment, resulting in a stool which though often normal in gross appearance has an increased percentage of total fat and an increase in the amount of unsplit component. With this there is a loss of fat soluble vitamins, especially vitamins A and D. It has been shown experimentally that this avitaminosis A results in metaplasia of the epithelium of the lung to the squamous type and in lowered resistance to infection of the respiratory tract unresponsive to ordinary treatment.

Andersen¹ classifies the clinical picture of these cases into three groups: (1) Patients who die in the first ten days of life because of meconium ileus, intestinal stenosis or atresia. (2) Patients who present symptoms referable either to the respiratory or gastro-intestinal tract and who usually die during the first year of life with predominant signs and symptoms being those of respiratory infection. (3) Patients with symptoms and signs of coeliac disease, but who in addition have chronic bronchitis or bronchiectasis and do not improve on the coeliac regimen alone.

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It is the group 2 cases which especially interest us and which are illustrated in the cases to be presented. One case of meconium ileus is included because of its rarity. Two of our group 2 cases were confirmed by autopsy findings. The third had a hectic course for some time with a debilitating pulmonary infection, but has fully recovered and at present is getting along well under the treatment which will be discussed below.

PATHOGENESIS

There have been various theories as to the pathogenesis of the lesion in the pancreas:

1. *Embryological*.—Rauch, Litvak and Steiner² have pointed out that the anlagen of the lungs and pancreas, which are derived from a common entodermal tube, are relatively close together and begin to appear almost simultaneously. They feel that in some children, constriction of some of the excretory ducts and bronchial passages occurs during their embryological development. The resulting picture would resemble that seen in cases of experimentally produced obstruction in animals and in cases of cystic fibrosis of pancreas in humans.

2. *Bacteriological*.—It has been hypothesized by some investigators³ that the underlying cause of the pancreatic lesion was virus in nature, but this view is not held by the majority of the workers in this field.

3. *Physiological*.—Farber⁴ has suggested that the cystic fibrosis is the result of an abnormally thick pancreatic secretion which causes an obstruction in the acini and small ducts leading to atrophy of structure with condensation of the connective tissue and growth of new fibrous tissue. Case 2 in the group presented in this paper showed such an abnormal secretion microscopically.

LABORATORY FINDINGS

1. *Microscopic examination of stool for fat*.—It has been shown by Andersen⁵ that there is a close correlation between the microscopic examination of stool for fat and the true total fat content. She concludes that "if a sample is graded 0 or + by microscopic examination the total fat present does not exceed 30% of the dried stool. If the sample is graded 3 plus or 4 plus there is an excess of fat in the stool; that is, the fat comprises more than 25% of the dried weight which is the upper limit of normal".

2. *Quantitative stool fat determination.*—This should be done on a 48 or 72 hour specimen. The laboratory procedure, however, is difficult and both the dry and wet stool methods have obvious errors. Andersen⁵ has analyzed the two methods meticulously and concluded that the dry stool determinations are the more accurate. We find that the patients with steatorrhœa due to cystic fibrosis, especially those under one year of age, are usually quite sick when the diagnosis is made, and we prefer not to wait for a 48 or 72 hour quantitative stool. Instead we prefer to do the microscopic test to prove that we have a steatorrhœa and if we get a 3 plus or 4 plus report we determine the type of steatorrhœa by a duodenal drainage. Then we are able to begin treatment without delay.

3. *Duodenal drainage.*—A small catheter is passed intranasally into the second part of the duodenum and the pancreatic juice is drained for a half hour before and after stimulation either with secretin or 0.1N hydrochloric acid. It is easy to tell when the tube is in the duodenum as the fluid drained off has the typical yellow green colour. The tube easily enters the duodenum as the greater curvature is practically horizontal in the infant. In cases of doubt fluoroscopy may be used for guidance. The technique used in our cases and the methods of analysis of tryptic and amylolytic activity were based on the paper by Philipsburn Jr., Lawrence, Stanley and Greengard.⁶ In cases of true fibrocystic disease there are three findings in the duodenal drainage: (a) The volume after stimulation is less than the volume before. (b) The enzymic activity before stimulation is below the minimum of the normal range. (c) The enzymic activity after stimulation is less than that before stimulation.

CASE 1

The first case was one of a four-month old female white child, admitted February 14, 1945, to hospital complaining of wheezing and rapid and difficult breathing of five days' duration, vomiting for several days and anorexia.

The child was born as the mother's fourth pregnancy. The other three children are alive and healthy. Antenatal course was uneventful. Delivery was not difficult though instrumentation was used. There was no asphyxia, cyanosis, hæmorrhages or eruptions. Birth weight was 10 lb. 6 oz. She was breast fed for the first six weeks. During this time she always coughed after eating and coughing was followed by cyanosis. From the sixth to the sixteenth week she was bottle fed on a formula of: evaporated milk 10 oz., water 20 oz., dextri-maltose No. 1, 3 tbs., 6 oz. q. 4 h.

Since the sixth week she has been about the same, continuing with a persistent slight cough and not gaining much weight. Since the ninth week the cough has increased a bit, has been paroxysmal, and has been followed by vomiting.

Functional inquiry was negative and non-contributory. Family history showed no hereditary tendencies to disease. On physical examination, the child appeared somewhat febrile, somewhat cyanosed, and had a continuous short hacking cough. The chest excursions were equal in both fields. There was slight dullness over the left upper lobe and scattered fine crepitations in both bases. Provisional working diagnosis was: bronchopneumonia; bronchiolitis; pertussis.

The urinalysis was negative. The white blood count was 14,650 with 2% non-segmented neutrophils, 52% segmented neutrophils, 42% lymphocytes and 4% monocytes. The red blood count was 3,530,000 and the hæmoglobin was 9.68 grams.



Fig. 1.—Microphotograph, high power, of the pancreas in Case 1 showing the fibrosis, dilatation of the ducts with hyaline plugs in their lumina and atrophy of the gland acini.

The child was put on routine pneumonia orders, sulfonamide therapy, and oxygen for cyanosis. The following day a chest plate was taken and showed no evidence of pneumonia or thymic enlargement. A Bordet Gengou cough plate was ordered. During the following two days she coughed continually and required continuous oxygen for cyanosis and vomited frequently. Interstitial saline was then given twice daily for dehydration. A repeat chest plate was negative for pneumonia. The following day physical examination revealed a slight increase in the antero-posterior diameter of the chest and the picture was one of early obstructive emphysema. Both fields were very resonant. Cyanosis and vomiting continued. The child was given 10 c.c. of pertussis antibacterial antitoxic serum intramuscularly.

Three days later cough plate report was negative and condition was unchanged. The respirations were of somewhat longer excursions than before and there were still some moist râles bilaterally. Temperature was elevated. White blood count was 37,000.

The progression of the above signs and symptoms, suggested a diagnosis of cystic fibrosis of the pancreas. The stool which was grossly normal though perhaps more odorous than usual was analyzed quantitatively for steatorrhœa. In the meantime she was put on penicillin 15,000 units intramuscularly q. 3 h. and was treated symptomatically for dehydration and cyanosis. A flat plate of chest was taken again. The report on this read as follows:

"Portable film examination shows very faint and widely scattered patchy mottling throughout the middle third of each lung. The right upper interlobar fissure

is well marked. The chest appears more capacious than usual and aeration is more marked than usual."

The stool fat report unfortunately came back as high normal but since we did not send a full 48-hour stool specimen for analysis we decided to begin treatment for cystic fibrosis. By this time, however, the child was physically going downhill and expired before we could begin the course of treatment.

On post mortem examination, the pancreas weighed 7.7 gm. and had a solid fibrosed appearance throughout its head and body. No cysts were noted on gross examination. The report on the microscopic section (Fig. 1) read as follows:

"There is a marked perilobular and interlobular fibrosis with dilatation of the small and large ducts which contain hyaline material. In some lobules the number of islets is markedly increased possibly from atrophy of the pancreatic acini."

On gross examination both lungs were large. The lower lobes of both lungs were consolidated and had the appearance of a confluent bronchopneumonia. Frank pus could be expressed on pressure. The upper and middle lobes of the right lung showed a small bronchiectatic area. Microscopic examination showed a diffuse pneumonia with local areas of polymorphonuclear exudate and many bacteria present. The blood vessels in the same area were involved in the inflammatory reaction.

Comment.—In this case, the autopsy findings confirmed the clinical diagnosis. A duodenal drainage was not done because the child was so debilitated that even raising the oxygen tent for two minutes brought on severe cyanosis.

CASE 2

This is the case of an eight-weeks old child, admitted to hospital June 11, 1945, in an emaciated dehydrated state, weighing only 4½ lb. and showing the same clinical picture as the first case, with obstructive emphysema, increase in antero-posterior diameter, and signs of pneumonia. Qualitative fat determination of stool showed marked increase in neutral fats. We followed this by a quantitative stool fat analysis on a 48 hour specimen and did a duodenal drainage. The child was then immediately placed on a regimen for pancreatic deficiency while awaiting laboratory reports. It was getting a high protein, high carbohydrate, low fat diet, similar to that of celiac disease, vitamin A and D, pancreatin and prostymin.

Unfortunately the child was too emaciated, and died before treatment could take effect. On post mortem examination, the lungs were markedly emphysematous and the pancreas was soft. The microscopic in this case, however, was quite different from the first one. The pancreas showed little if any fibrosis in two sections taken and the acini were only somewhat dilated. However, the ducts contained the abnormal hyaline-like secretion which Farber describes and the acinar cells showed a peculiar granularity and occasional vacuoles. The lungs showed early emphysema with scattered areas of atelectasis. No areas of metaplasia were noted. Finally this case was unique in that the urinary bladder was firmly contracted and had a thick wall and both ureters were thickened and dilated. On section the kidneys were normal and the walls of the ureters were thick but no leukoplakia was noted. The bladder wall was about 0.25 inches thick and the mucosa was especially thickened. On microscopic examination, the surface layer of the transitional epithelium was swollen and eosinophilic. There was a tendency for the nuclei to be elongated and run parallel with the surface. The cells were being shed. This condition was not present in the ureter. It does not seem to represent a complete squamous metaplasia but a hyalinization of the surface layer with tendency to desquamate.

The results of the duodenal drainage were interesting. Unlike a typical fibrocystic case, the volume of juice

obtained after intraduodenal stimulation with 0.1 N hydrochloric acid was greater than before. The enzyme activity, however, was consistent with a diagnosis of pancreatic deficiency—4.05 gm. of nitrogen being liberated from a casein substrate per 100 c.c. of pancreatic juice. This is just below the normal minimum for a child of this age and weight. After stimulation intraduodenally by 0.1 N Hcl., only 1.35 gm. of nitrogen were liberated.

COMMENT

The post mortem findings of early changes in the pancreas, the findings in the lungs of atelectasis and emphysema, and the laboratory findings on stool examination and duodenal drainage sustain a diagnosis in this eight weeks old 4½ lb. infant of *hypochylia pancreatica*, there being definite deficiency in pancreatic activity though a true fibrosis was not present. Perhaps if this infant had lived longer without treatment, the changes in the pancreas would have gone on to fibrosis and cyst formation as Farber hypothesized.

CASE 3

This two-months old female white baby was admitted to hospital July 13, 1945, complaining of umbilical hernia, cough of one week's duration, fever for three days, and vomiting occasionally after meals for one month. The child was its mother's first baby. Pregnancy was uneventful. She had been sneezing and vomiting occasionally since one month of age. One week before admission she developed a non-paroxysmal cough productive of a small amount of sputum. Physical examination revealed a well developed, well nourished baby, weighing 9 lb. 4 oz. lying comfortably in bed. The ears were clear with normal drum markings. Throat was somewhat injected. Chest was normal except for some mild dullness in the right upper lobe and for a fullness in the antero-posterior diameter. Abdomen showed no masses, tenderness or rigidity. The liver and spleen were not palpable. There was an umbilical hernia present. The urine was negative. The blood showed a white count of 13,700 with 34% neutrophils, 58% lymphocytes, 5% monocytes and 3% eosinophiles. The red blood count was 3,750,000 and the hemoglobin 10.29 gm. Flat plate of chest was negative. She was treated for her upper respiratory infection and progressed well and uneventfully. Eleven days after admission her temperature rose to 102.8° F., her breathing was rapid and laboured and her abdomen was somewhat distended. The findings of signs and symptoms of right upper lobe pneumonia, distended abdomen and unexplained recurrence of pulmonary infection suggested the possibility of fibrocystic pancreatic disease. That day two stools were tested microscopically for fat and showed 4 plus fat. Because of the poor prognosis and rapid downhill course in these cases, we decided not to wait for duodenal drainage and to begin treatment immediately. When the child was clinically improved, one week later, two duodenal drainages were done. Both showed marked diminution in tryptic activity, 100 c.c. of pancreatic juice liberating 2.3 gm. and 1.3 gm. of nitrogen respectively from a casein substrate. After intraduodenal stimulation with 0.1 N Hcl., the grams of nitrogen liberated from the casein substrate diminished respectively to 0.07 and 0.1; this lack of response to stimulation is characteristic of fibrocystic disease. The only findings which needs explanation is the fact that before stimulation the volume of pancreatic juice liberated in ½ hour was 4.4 c.c. and after stimulation it increased to 6.2 c.c. We feel that this increase in volume of 1.8 c.c. after stimulation was not real but due to some of the 0.1 N Hcl. used for intraduodenal

stimulation having been collected with the juice. This seems rational as the pH of juice collected before stimulation was 5.0 and that after stimulation was 4.5.

The treatment followed in this case was similar to that of Case 2 and was adapted from the regimen suggested by Dr. Andersen.⁷ In short, the infant received:

1. *Diet*.—Protein milk sweetened with banana flakes and honey.
2. *Pancreatin*.—One gram per 6 oz. of formula.
3. *Oleum percomorphum*.—m xv t.i.d. for vitamins A and D.
4. *Prostigmin*.—mgm. iv t.i.d. to aid intestinal tone.
5. *Penicillin*.—15,000 units intramuscularly q. 3 h. to control the pulmonary infection. This was necessary for six days.

In six weeks' time the child did remarkably well. She passed the initial period of anorexia to the new diet and began to gain weight.

COMMENT ON TREATMENT

1. *Diet*.—The initial diet is a high protein formula with banana flakes and honey to supply easily digestible carbohydrates. The daily caloric intake should be about 30 to 50% above the amount which would be given to a normal infant of the same weight. This compensates for loss of food which is either undigested or not absorbed because of diminished intestinal tone. After the initial period of anorexia, the infant soon begins to gain weight. Fat may be introduced into the diet much earlier than in a case of coeliac disease as the powdered pancreatin which is added to each feeding contains the lipase for its digestion.

2. *Pancreatin*.—One gram of the powder added to each 6 ounces of formula just before feeding is usually sufficient. If this quantity is used, enough passes through the stomach without being destroyed to supply a sufficient amount of amylolytic, tryptic and lipolytic activity to compensate for the deficiency in the pancreas.

3. *Oleum Percomorphum*.—Oral administration of vitamins A and D gives better results than the parenteral methods. Large doses, however, must be used.

4. *Prostigmin*.—The use of prostigmin appears to be beneficial in increasing intestinal tone and thus aiding absorption.

5. *Penicillin*.—These infants are usually quite ill due to the pulmonary infection at the time diagnosis is made. It is advisable to use penicillin in large doses until the pulmonary infection is controlled.

CASE 4

This is the case of a one-day old white male child. He was born as the mother's thirteenth pregnancy on January 3, 1945. The mother's general health was good. Pre-natal course was uneventful. Birth weight was 8 lb. 10 oz., delivery being a difficult one. The physical condition at birth was fair but the abdomen was greatly distended. The infant died five hours after delivery. On post mortem examination, the small bowel and the large bowel as high up as the transverse colon

were filled with a thick black tarry plug of meconium which was firmly adherent to the mucosal walls and did not wash away with water. The bowel was distended and the small bowel showed a rupture. Unfortunately at the time the condition was not recognized as a case of meconium ileus and no sections of the pancreas were taken.

We now feel, in retrospect, that this belongs to the first group of cases in Andersen's classification, and that, as first pointed out by Lansterner⁸ in 1905, the condition is due to some error in metabolism as a result of a failure of the pancreatic or biliary secretion. Very often the first discharge from the bowel of a newborn contains a thin pencil-like greyish white mass which is putty-like in consistency and is called a "meconium plug". In rare instances, the entire canal becomes filled with it, causing distension. In very rare instances, the material is not discharged and causes a complete obstruction and, as in our case, results in an actual rupture of the bowel. The pathogenesis of the condition is discussed in detail by Dodd.⁹

In the cases that have been reported with full post mortem studies there was an interstitial pancreatitis with increased fibrosis and slight inflammation, both interlobular and intralobular and dilatation of the acini and ducts. The deficiency of the pancreatic juice results in a failure of digestion of fat and protein in the meconium resulting in a thick putty-like meconium plug which causes complete obstruction and even rupture if the condition persists.

SUMMARY

Four cases are presented of pancreatic deficiency in infants under 4 months of age. One with cystic fibrosis of pancreas was confirmed by autopsy. One case, in an infant only eight weeks old, was also confirmed by autopsy. A third case in a child two months old was confirmed by duodenal drainage responded well to treatment. The fourth case, meconium ileus in a newborn, is included because of its rarity.

We feel that these cases occur more frequently than we would expect and that though the prognosis is poor, if diagnosed early, they often respond well to treatment.

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PICROTOXIN FOR BARBITURATE POISONING

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THE extensive use of barbiturates today has given rise to many cases of poisoning and to some deaths, either accidental or from intent. To prevent death when large doses of barbiturates have been taken, it is essential that the physician know what to do, how to do it and when to do it. There is little doubt now that the drug of choice in the treatment of cases of severe barbiturate poisoning and coma is picrotoxin. Picrotoxin is a highly dangerous drug and if not used properly, it may actually hasten or make certain the death of a patient in barbiturate coma. While the effects of barbiturates are well known, the action of picrotoxin is not so well understood by the profession, because it was a little used drug until recent years. The purpose of this short paper is not to review the extensive knowledge which we have concerning picrotoxin, but to present the essential points necessary to its proper use in barbiturate poisoning.

Shortly after the introduction of chloral hydrate as a sedative and hypnotic drug in 1869 by Liebreich, Browne¹ reported in 1875 that picrotoxin was an effective antidote in chloral hydrate poisoning. In the years that followed, this finding was confirmed and extended to other drugs which depress the central nervous system. The barbiturates were introduced as therapeutic agents in 1903 by Fisher and von Mering. As they came to be extensively used, many cases of poisoning and death occurred but it was not for more than a quarter of a century that picrotoxin was proved again to be the best antidote. In 1931, Dr. A. L. Tatum and his associates² systematically investigated possible antidotes, including nikethamide (coramine), strychnine, brucine, cocaine, physostigmine, ephedrine and others. They found them all to be ineffective in severe barbiturate poisoning and reported that picrotoxin was the only agent which stood a chance of preventing death. This work has been extensively confirmed both in animals and in man.

It is important to understand the mode of action of picrotoxin in barbiturate poisoning. Picrotoxin does not directly neutralize the toxic effects of barbiturates: rather it keeps the patient alive until all or most of the depressant drug has been oxidized or eliminated from the body. Thus, for example, picrotoxin does not awaken the patient in barbiturate coma; that does not occur until the excess barbiturate has been taken care of by the body. What actually happens is that we superimpose picrotoxin poisoning upon barbiturate poisoning. Picrotoxin is a convulsant toward the medulla oblongata and lower centres of the nervous system. A patient in severe barbiturate coma has a marked depression of the entire central nervous system, including the vital cardio-respiratory centres in the medulla oblongata. Picrotoxin is thus given in large doses so that its convulsant effect upon the medulla oblongata will offset the depressant effect of the barbiturates and keep the patient alive until the barbiturate has been oxidized or eliminated. Therefore, when we use picrotoxin in barbiturate coma, we try to give just enough to keep the patient alive but not an excess which will cause convulsions.^{3, 4}

Picrotoxin is a white, crystalline powder of bitter taste and soluble in water to about 1 in 200 or 250. Fortunately, it is rapidly destroyed in the body, in the matter of a few minutes or an hour at most,⁵ so that should a patient in barbiturate coma be given slightly too much picrotoxin and convulsions occur, they do not last long and we do not have to be unduly concerned about them, providing they are not severe and due to a large excess of picrotoxin. The drug may be obtained from several pharmaceutical houses either as a powder or in ampoule form. For patients with mild barbiturate coma, the ampoules are indicated but if the coma is severe and due to a large dose of barbiturate, I have found it more convenient to make up a solution in sterile, isotonic saline, of picrotoxin powder, 1 mgm. to 1 ml. of saline, the drug weighed out as aseptically as possible and the final solution sterilized by gentle boiling. This solution is then given by continuous intravenous drip at a rate depending upon the degree of coma but on the average about 1 ml. per minute. The actual technique of administration is as follows.

First, it is important to start picrotoxin therapy early, as soon as a diagnosis of barbiturate poisoning has been made. The diagnosis may be obvious but if there is any doubt, chemical tests may be applied to samples of blood and urine and these tests may be done quickly if the reagents are available. Early picrotoxin therapy is essential because after a patient has been in barbiturate coma for two or three days a pulmonary oedema tends to develop, and this complicates treatment and increases the possibility of death. Having established the diagnosis of barbiturate coma, begin continuous intravenous drip therapy with the solution of picrotoxin in saline described above. It is useful to have a two-way valve arrangement, one lead going to the picrotoxin-saline solution and the other to isotonic saline. The picrotoxin solution is then injected at a rate just sufficient to keep the patient breathing deeply with a good blood pressure and pulse and in a state of slight hyperreflexia. A useful guide as to dosage is to give enough picrotoxin so that the patient will twitch slightly when pinched, or tapped, or a needle point applied to the skin.

It is of the utmost importance to remember that picrotoxin therapy should be continuous even though slight convulsions may occur. Since picrotoxin is being given in sub-convulsive doses, it frequently happens that a slight convulsion or two may occur during a protracted course of therapy. One not familiar with the pharmacology of picrotoxin may be tempted to discontinue use of the drug at the onset of a convulsion. On no account should picrotoxin administration be discontinued during a convulsion, because if the drug is stopped, picrotoxin convulsions are followed by a deep coma, which, added to the barbiturate coma, may prove fatal.⁶ Therefore, should the patient begin to convulse, the dose of picrotoxin should be cut down by reducing the rate of administration of the picrotoxin solution until the convulsion has passed, which ordinarily will be in a few minutes. Then the rate of administration of the picrotoxin solution is raised to meet the requirements noted above.

A very practical point is that the administration of picrotoxin requires the constant attendance of a physician, keeping a continuous watch on the patient. If a very large dose of barbiturate has been taken by the patient, picrotoxin

therapy may require 12, 18 or 24 hours, and arrangements should be made to have two or more physicians take shifts in watching the patient and administering the drug.

These several points are all of the utmost importance. Their significance has been impressed upon the author not only from the reading of the literature but from personal experience in consultations upon patients in barbiturate coma. Regarding the total dose of picrotoxin, the author is of the opinion that most physicians err on the side of giving too little, rather than too much, of the drug. The largest dose which the author has advised was some 1,450 mgm. of picrotoxin given over a period of almost 24 hours, after which the patient awakened and came out of the barbiturate coma with no harmful effects either from the barbiturate or from the picrotoxin.

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RÉSUMÉ

Le meilleur antidote contre les barbituriques est la picrotoxine. Celle-ci n'agit pas en neutralisant l'effet toxique des barbituriques mais en excitant le bulbe que les barbituriques ont déprimé. A la dose de 1 mg. par ml en goutte à goutte intraveineux la picrotoxine est donnée continuellement à la dose sub-convulsivante jusqu'à ce que le malade sorte du coma. L'auteur a pu donner sans danger 1450 mg. de picrotoxine en 24 heures.

JEAN SAUCIER

SOME ASPECTS OF PENICILLIN THERAPY IN EARLY SYPHILIS

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and

Major Norman M. Wrong, R.C.A.M.C.

THE following four case reports illustrate the effect of penicillin, used during the incubation period of acquired syphilis, in masking the development and diagnosis of the disease. These cases are representative of a group of over thirty similar ones seen in a few of the Canadian Military Hospitals Overseas by the writers of this article.

CASE 1

R.C.E., aged 23, Canadian soldier. This patient developed a urethral discharge positive for gonococci on March 28, 1945, following exposure 11 days previously. He was given 100,000 units of penicillin intramuscularly (20,000 units q. 3 h. x5 doses) on March 29,

and was discharged to duty on March 31 with instructions to report to his unit medical officer in 3 months for test of cure and blood Kahn. He developed scabies about April 15, and on April 28, noted a small area of redness at the frenum near the site of some scabetic papules. This area broke down about May 5, forming a small, circular, punched-out ulcer. This was not reported until May 16 at which time he was seen at the V.D.S. Outpatient Clinic where admission to hospital was advised. Blood Kahn and dark field examinations of that date were negative. He was admitted to hospital on May 21, where physical examination revealed a small circular area of superficial ulceration at the frenum with rolled edges and indurated base. The inguinal lymph glands were enlarged, rubbery, discrete, but not tender. Remainder of examination was essentially negative. This ulcer was clinically very suspicious of a primary chancre. However, dark field examinations of this were negative for *treponema pallidum* on 16 examinations between May 22 and June 13, gland puncture was negative on June 2, and blood Kahns were negative on May 24, June 3 and June 11. The dark field examination on the ulcer on June 14 (18th examination) showed typical treponemas and a diagnosis of sero-negative primary syphilis was made. The patient was then given 2,400,000 units of penicillin intramuscularly (40,000 units q. 3 h. x60 doses) from June 14 to June 22. The penile ulcer which had remained unchanged during the period of investigation showed evidence of healing within 18 hours after commencement of penicillin therapy and was practically healed by June 23. Blood Kahn on completion of therapy was negative.

COMMENT

This case illustrates the possible delay in the occurrence of a positive serological reaction and the need for repeated dark field examinations on penile ulcers, typical or atypical of primary chancre, in patients who have received penicillin therapy for gonorrhoea contracted at the same time as syphilis.

CASE 2

D.J.B., aged 23, Canadian soldier. This patient gave a history of exposures on January 31 and February 23. He developed a urethral discharge positive for gonococci during the first week of March and on March 10 received 120,000 units of penicillin intramuscularly (20,000 units q. 3 h. x6 doses). On April 25, he noted a painless ulcer near frenum of penis and was admitted to hospital on April 30. Examination, as in the previous case, showed an ulcer suggesting a primary chancre, with associated inguinal lymphadenopathy. Dark field examinations on the ulcer were done on 7 occasions between April 26 and May 11 and were negative for *treponema pallidum*. Gland punctures were also negative on May 1 and May 15. The 8th dark field examination of the ulcer (May 18) showed typical treponemas. Blood Kahns on May 4, reported a doubtful positive, May 11 positive (1+) and May 17 positive (2+). On the basis of these findings a diagnosis of sero-positive primary syphilis was made and the patient was given 2,400,000 units of penicillin (40,000 units q. 3 h. x60 doses) between May 18 and May 26. The ulcer healed rapidly under treatment and he was discharged to unit on May 28.

COMMENT

As with Case 1, this further stresses the possible difficulty in the bacteriological diagnosis of primary syphilis and the need for repeated dark field examinations in this type of case. The delay in the appearance of the

primary chancre (61 days after exposure) may also be due to the administration of penicillin early in the period of primary incubation.

CASE 3

N.K., aged 36, Canadian soldier. This soldier developed a slight, whitish, watery urethral discharge, unaccompanied by burning, on April 8, 1945, following exposure 15 days previously. On April 19 he was admitted to a forward hospital unit where smears of the urethral discharge were taken and reported negative for gonococci. A diagnosis of non-specific urethritis was made and he was given 16 grams of sulfathiazole over 3 days, followed by 120,000 units of penicillin (20,000 units q. 3 h. x6 doses) on April 23. Blood Kahn on April 27 was positive (2+). He was discharged from hospital during the first week in May with instructions to report for blood Kahn in one month's time. Blood Kahn on May 28 was negative. The urethral discharge was unaffected by the above therapy and persisted. About June 17, he was aware of some tenderness about the urinary meatus and noted some swelling and ulceration in this area. He was admitted to hospital on June 22 at which time physical examination showed redness and linear ulceration about the margin of the urinary meatus, a few enlarged, rubbery, discrete, non-tender inguinal lymph glands. The remainder of the examination was essentially negative. Dark field examination on this meatal ulcer was positive for *treponema pallidum* on June 22 and patient was started on penicillin therapy (40,000 units q. 3 h. x60 doses). A marked Herxheimer reaction was noted during first 18 hours of therapy. Blood Kahn on June 22 was positive (4+).

COMMENT

This case also illustrates the delay in the appearance, and the atypical character of the primary chancre which may occur in cases of syphilis which have received penicillin therapy during the incubation period of the disease. The serological reversal and the subsequent serological relapse after only 120,000 units of penicillin is of further interest in this case.

CASE 4

R.J.W., aged 30, Canadian soldier. This patient developed a yellowish purulent urethral discharge on April 27, 1945, following exposure on April 20. On April 28, he was given 120,000 units of penicillin (20,000 q. 3 h. x6 doses). About May 15, the urethral discharge recurred and persisted as a slight morning moisture. About June 24 he first noticed a hard, large, slightly tender swelling in the left groin. On June 27, he was unable to retract the prepuce and was admitted to a forward medical installation on June 30, where examination showed a moderate phimosis. After some difficulty the prepuce was retracted revealing a large indurated ulcer on the mucosal aspect of prepuce about 1/2" above the corona. In the next 48 hours he developed a severe balanitis and considerable purulent discharge, not urethral in origin. The balanitis slowly cleared on sulfathiazole therapy and cold compresses and on July 11 prepuce was retracted and a dark field was taken which proved to be positive for *treponema pallidum*. Blood Kahn on July 3 was positive (4+). A diagnosis of sero-positive primary syphilis was made and patient was started on penicillin therapy on July 11. There was a marked Herxheimer reaction the first night. The penile ulcer was completely healed by July 15.

COMMENT

This case demonstrates the necessity for careful clinical and serological follow-up of patients who have received penicillin therapy for gonor-

rhœa, as many of these may have contacted syphilis at the same time. Kemp and Shaw (1936) quoted by Stokes¹ found that 26.4% of 155 syphilitics in 1,000 cases of acute gonorrhœa had contracted their syphilis simultaneously with the gonorrhœal infection, an incidence of double infection of 4.09%, and this figure would likely be increased in countries where the ratio of new cases of syphilis to gonorrhœa is much higher than in the U.S.A. Stokes¹ stresses the importance of serological follow-up of cases of gonorrhœa since 16% of patients with syphilis can give no history other than that of previous gonococcal infection. The reasons for withholding penicillin, locally or systemically, in all cases of balanitis until syphilis has been ruled out are obvious.

DISCUSSION

The introduction of penicillin into the armamentarium of the physician has not been without its hazards. Though numerous clinical reports in current medical journals have demonstrated clearly its therapeutic efficacy in the treatment of gonorrhœa and early syphilis, there is no evidence to date to show that penicillin administered during the primary incubation period of syphilis will prevent the development of the disease. The foregoing case reports are presented to illustrate that though penicillin may not prevent the disease it may modify it so that early bacteriological and serological confirmation is rendered very difficult and in some cases impossible. This naturally allows the infection to become more strongly established and thereby lessens the chances of early and complete cure. This modification of the disease may take various forms, of which the following have been noted: (1) Delay in the appearance of the primary chancre (up to 60 to 70 days instead of the average 26 days). (2) Delay in the appearance of positive serology (up to 4 to 5 months instead of the average 45 days from the date of infection). (3) Atypical appearance of the primary lesions. It is also possible that the initial lesion may be modified to such a degree as not to be noticed by the patient and thus allow the disease to pass on to the stage of infectious relapse, recurrence or clinical latency. (4) It is often impossible and frequently difficult to obtain positive dark field results from either the primary ulcer or regional lymph nodes.

SUMMARY AND CONCLUSIONS

Four case reports illustrating some of the effects of the administration of penicillin during the primary incubation period of early syphilis have been recorded. A knowledge of these effects is essential to the physician or surgeon who intends to use penicillin, and, to further this objective the following suggestions are put forward:

1. Before instituting penicillin therapy for the treatment of any infection, venereal or non-venereal, a complete physical examination should be done so that early syphilitic lesions may not be overlooked.

2. Where penicillin is used for the treatment of gonorrhœa it is essential that follow-up clinical and serological checks be done at least three and six months following completion of therapy.

3. In cases of urethritis where any doubt or suspicion is held regarding the possibility of syphilis being present, sulfathiazole or sulfadiazine should be used instead of penicillin.

4. All cases of balanitis with or without discharge, and cases of non-tender inguinal adenitis should be regarded as syphilitic in origin until proved otherwise.

5. Penicillin should *never* be used locally on genital lesions without first *definitely* excluding syphilis.

6. A routine question in taking the history of any patient with suspected venereal disease should be: "Have you ever had penicillin treatment for any infection in the past six months", and if so, "when and how much did you have?"

7. With the widespread use of penicillin in both civil and military medicine it more than ever behooves every physician and surgeon, quoting Stokes, "to raise his index of suspicion".

REFERENCE

1. STOKES, BEERMAN AND INGRAHAM: Saunders, 3rd. ed., page 492, 1945.

RÉSUMÉ

La pénicilline peut masquer une syphilis débutante. Par conséquent, il faudra, en présence d'une maladie vénérienne examiner soigneusement le malade et rechercher la syphilis. Le traitement de la gonorrhée par la pénicilline ne dispense pas de faire l'enquête sérologique de la syphilis pendant les 6 mois qui suivent. Dans le cas d'urétrite on emploiera les sulfas de préférence à la pénicilline si la syphilis est aussi soupçonnée. Toute balanite et toute adénite inguinale devra être jugée syphilitique jusqu'à preuve du contraire. La pénicilline ne sera pas employée localement avant d'exclure la syphilis. On devra demander au sujet s'il a déjà été traité par la pénicilline.

JEAN SAUCIER

THE ROLE OF PENICILLIN IN THE TREATMENT OF CHRONIC OSTEOMYELITIS

By Surgeon Lieutenant Commander
H. D. Hebb, R.C.N.V.R.

THE treatment of chronic osteomyelitis is a problem not yet successfully solved. In modern surgery, the problems have revolved around (a) the extent to which diseased bone should be removed; (b) the time at which to perform operation; (c) the method of filling in bone defects; and (d) the method of treatment before and after operations.

An investigation was undertaken at Christie St. Hospital, Toronto, in October, 1943, to study the effects of penicillin in the treatment of chronic osteomyelitis resulting from compound fractures or blood-borne infection. Of the 57 cases in this series, who were initially treated between October, 1943, and August, 1944, 43 were cases of septic compound fractures following battle wounds or accidents, while 14 were of hæmatogenous origin. Fifty cases have been followed to December, 1945.

In the first six weeks of the investigation, penicillin therapy was used alone. As the results of this initial study were disappointing, surgical measures were also used in subsequent cases when indicated.

OUTLINE OF INVESTIGATION

Penicillin therapy.—At first sodium penicillin was administered by the intravenous route. A dose of 5 to 10,000 units was injected every two hours into the rubber tubing of a continuously running saline infusion. Because of the frequency of thrombophlebitis, and the disadvantage of keeping the patient's limb immobilized, this method was later abandoned in favour of the intramuscular route. The injections were given into the gluteal muscles in doses of 20,000 units (dissolved in 2 c.c. normal saline) every four hours.

In those cases in which operative procedures were indicated, penicillin was usually administered before operation for several days, and continued after operation for periods of one to three weeks depending upon the extent of the lesion and the clinical response of the patient.

In a number of cases, local administration of penicillin was combined with systemic therapy. In some instances it was applied at the time of

operation in the form of penicillin-sulfathiazole powder (5,000 units per gram); in others, penicillin in saline, (1,000 units per c.c.), was instilled into sinuses; and in still others, penicillin was used in a cream (200 units per gram) applied directly to the open wound.

Surgical procedures.—The general plan of operative procedure was to remove all readily accessible sequestra. Saucerization of the surrounding diseased bone was done if considered necessary. When a large bony defect was present, a muscle graft or, more recently, cancellous bone graft was used. In some instances, the wound was tightly closed; in others, a small penrose drain was inserted either into the operative wound, or into the sinus. Depending upon the site and extent of the lesion, plaster of paris bandages were applied. These were left undisturbed for at least several days and sometimes several weeks. In one instance, a Symes' amputation was performed.

Bacteriological studies.—During the first two months of this investigation, bacteriological smears and cultures of the discharge were taken whenever the dressing was changed. Thereafter specimens were taken only once a week or whenever a cast was removed.

Study of toxic reactions.—Observations were made to determine the degree of toxicity in the various products used. Special attention was paid to general reactions, e.g., chills, fever, nausea, vomiting, headache, urticaria; and local reactions, e.g., frequency of thrombophlebitis when given intravenously and pain at the site of intramuscular injection.

RESULTS

I. Effect of penicillin therapy alone.—In the autumn of 1943, when penicillin was used alone in the treatment of various types of chronic osteomyelitis, 17 cases were treated. Nine cases had sequestra or bony cavities. Of the remaining 8 cases, 4 had had operations prior to the investigation, 3 showed lesions which were not likely to be benefited by surgery, while one had an extensive infection in the foot involving all the tarsal and metatarsal bones caused by crushing in a motorcycle accident. The foot was obviously useless and required amputation.

It was observed in all cases that, within a few days after the commencement of penicillin therapy, there was a definite reduction in the amount of discharge. The gross appearance usually changed from a thick purulent exudate

to a thin serous one, and often became free of organisms. In 7 instances, the sinuses healed temporarily. Of the remaining 10 cases in which a slight discharge persisted, organisms could be demonstrated in only 6 cases but healing did not occur.

There were 9 cases in which sequestra or bony cavities could be demonstrated. Two of these had sinuses which actually healed during penicillin therapy. They recurred however, one and five weeks later. In the other 7 cases, the discharge persisted throughout the whole period of therapy. It became obvious as the study progressed that these patients required surgical measures in addition to penicillin therapy.

Of these 17 cases, the 3 who did not require surgical intervention are included in section II below while the other 14 are considered in section III.

II. *Effect of penicillin alone in five cases not requiring operation, or in which operation was contraindicated.*—Penicillin therapy was used in four cases in which sequestra or bone cavities could not be demonstrated and in one long-standing case in which further operation was contraindicated. The sinuses of three cases healed. The discharge in the other two was greatly reduced in amount and became free from organisms.

CASE 1

G.D. *Osteomyelitis of tibia* of six weeks' duration which developed during recovery from a rib resection for empyema. Pus was aspirated from the knee joint and x-ray showed osteoporosis of the medial condyle. Despite sulfonamide therapy, the patient's condition had progressively deteriorated and the infection had spread to the soft tissues of the leg, giving rise to ulceration and necrosis extending from knee to ankle. *Staph. aureus*, *B. pyocyaneus*, and *Strep. hemolyticus* were cultured from the lesion. Patient was gravely ill for several weeks. Penicillin was given intravenously, 60,000 units per day for 20 days. Later, penicillin was given intramuscularly, 40,000 units per day for 24 days. In addition, penicillin was given locally 50,000 units per day for three days into the knee joint. He improved rapidly. Temperature became normal on the 8th day. The necrotic ulcerative area acquired a clean, granulating surface, permitting a large skin graft to be successfully performed during the 5th week. Complete healing took place in two and a half months. X-rays one year later showed no osteoporosis. This patient has remained healed for 22 months.

CASE 2

G.D. *Osteomyelitis of tibia* following compound fracture due to high explosive shell in May, 1944. X-ray showed a vertical fracture of lower third of tibia extending into the ankle joint. Considerable osteoporosis of lower end of tibia could be demonstrated. Patient had a continuous, foul discharge from a sinus for a period of three months, mixed organisms with streptococci predominating. Penicillin given intramuscularly 120,000 units per day for only 40 hours. The discharge ceased within 48 hours and the sinus healed. Present x-rays

show fusion of ankle joint while the amount of osteoporosis has diminished. This patient has remained healed for 15 months.

CASE 3

G.H. *Osteomyelitis of thoracic vertebrae* following an injury to back in 1917. X-rays showed fusion and sclerosis of bodies of 4, 5, 6 and 7 thoracic vertebrae with marked kyphosis in mid-dorsal region. In 1933, an abscess formed in this region, which was drained. Since that time, there has been a continuous discharge from four sinuses. Organism: *Staphylococcus*. Penicillin given intramuscularly 120,000 units per day for 34 days beginning May 29, 1944. Complete healing of all sinuses occurred in ten days. Four months later, a slight watery discharge appeared and lasted for two days. Fourteen months later, a similar discharge again recurred and lasted four days. Since then, this discharge lasting about one day has recurred each month. Final x-ray showed no change.

CASE 4

E.C. *Osteomyelitis of pelvis and femur* following a gunshot wound in 1918. Numerous operations had been performed for the removal of foreign bodies, sequestra, and for the drainage of abscesses. In March, 1920, the infection caused a profuse secondary hemorrhage which required ligation of the external iliac artery and vein. Collateral circulation maintained adequate blood supply to the limb. Several discharging sinuses persisted. In 1925, an osteotomy was performed at hip joint. During the following sixteen months, the sinuses remained healed. In 1926, the sinuses began once again to discharge copious amounts of pus. This condition remained unchanged throughout the next seventeen years. His general condition, however, was excellent. He was able to lead an active life in spite of the fused hip and the copious discharge which required frequent dressings.

In December, 1943, he was treated with penicillin. At that time, x-ray showed a fused hip joint, a few small foreign bodies in the region of the neck, and marked sclerosis of greater trochanter, neck and head of femur as well as of the acetabulum. Organisms: *Staph. aureus*, and *Strep. hemolyticus*. Penicillin was given at first intravenously, later intramuscularly 120,000 units per day for 38 days. On the fifth day, the discharge began to diminish and on the completion of treatment was very scanty. Cultures were negative on the eleventh day. In March, 1944, a second course of penicillin therapy was given because of a slight increase in discharge and a return of organisms. The second course consisted of 60,000 units every three hours for twelve days. During this time, the discharge again diminished and the organisms disappeared. In addition, local injections of 10,000 units into the sinuses were done each day for eight days. It was felt, however, that local therapy had little or no effect. Since July, 1944, penicillin has been continued at the rate of 100,000 units per day until the present time (December, 1945). Latest cultures of the discharge show no organisms. Discharge is from one sinus requiring a small dressing twice a week. X-rays show no change.

CASE 5

L.B. *Osteomyelitis of 2nd lumbar vertebra* (August, 1942). In October, 1942, an abscess in this region was opened and drained. Since that time, there had been a persistent discharge for 13 months. Organism: *Staph. aureus*. In November, 1943, penicillin was given intravenously 120,000 units per day for three weeks. The discharge gradually diminished, and disappeared completely on the 33rd day. Cultures were negative on the fourth day. Shortly after the sinus healed, the discharge recurred for a few days. During the next four months, recurrences were frequent. For the last twenty months, however, the sinus has remained completely healed. X-ray examination taken one year after treatment showed no change.

TABLE I.
RESULTS OF VARIOUS OPERATIVE PROCEDURES IN
CONJUNCTION WITH PENICILLIN THERAPY

	No. of cases	Healed	Unhealed
Removal of sequestra.....	38	31	7
Saucerization.....	5	4	1
Drainage of soft tissue abscess.....	7	6	1
Removal of foreign body...	1	1	0
Amputation.....	1	1	0
Total.....	52	43	9

III. *Effects of penicillin in conjunction with operative procedures.*—Operations were performed on 52 cases with either sequestra, bony cavities, foreign bodies, or associated soft tissue abscesses. The primary reason for operation in 38 cases was the removal of sequestra; in 5, the saucerization of bony cavities; in 7, the drainage of associated soft tissue abscesses; in one, the removal of a foreign body; and in one, a Symes' amputation. Penicillin therapy was given to all patients.

As shown in Table I, healing occurred in 43 cases. The wound was closed without drainage in 11 instances; 8 healed by primary intention in 7 to 20 days; 3 broke down but later healed within one month. The wound was either packed with gauze, or allowed to drain in the remaining 32 healed cases. Healing occurred more slowly in these patients and varied from 2 weeks to 4½ months depending chiefly upon the extent of the lesion and the amount of skin-loss.

Recurrence of a sinus following operation occurred in 24 of the 52 cases. Five of these healed spontaneously without further treatment. Sixteen were due to sequestra still remaining or recurring, cavities inadequately saucerized, or bony involvement too extensive to be totally removed at one operation. When these were operated upon at a later date, complete healing occurred in 13, while in 3, sinuses persist. The remaining three cases still require a second operation.

In Table I, 9 cases are tabulated as unhealed. The following conditions probably account for this: (a) extensive involvement of shafts of long bones in which adequate surgical procedures have not yet been feasible (3 cases); (b) cavities remaining in bone that require muscle or cancellous bone grafts (2 cases); (c) sequestra remaining or reforming (4 cases).

The following case reports are selected to illustrate some of the various types of lesions treated in this series:

CASE 1

W.H. Brodie's abscess of femur. X-ray showed a rarefied zone about the size of a walnut in the lower end of the femur. The cavity was unroofed and saucerized. Organism: *Staph. aureus*. Healing was by primary intention in ten days. About 20 c.c. of blood-stained fluid was aspirated below the healing scar on the tenth day. Culture of the fluid was sterile. It did not reform. Patient was discharged from hospital fit for duty on the 4th week. Penicillin had been given intravenously 120,000 units per day following operation for fourteen days. Penicillin was also used locally 10,000 units into the cavity at the time of operation. Six months later, pain and swelling recurred. An abscess had formed in the thigh which was opened and drained in another hospital. At this time, penicillin was not used. Healing occurred in three weeks. He had two similar recurrences, 18 and 21 months later. Although healed for the past month, his leg is sore and stiff.

CASE 2

D.H. Osteomyelitis of femur following a compound fracture due to shrapnel on December 17, 1943. Since that time, there had been a continuous discharge from the lateral aspect of the thigh. Organism: *Staphylococcus*. X-ray showed a united fracture of the middle of the shaft in fair alignment. At the site of fracture there was considerable sclerosis, a few sequestra and a large cavity present. On May 2, 1944, a sequestrectomy was performed, and penicillin was given intramuscularly 120,000 units per day before and after operation for a total of nineteen days. In spite of this, the discharge persisted. Another sequestrectomy was performed on July 18, and a similar course of penicillin was given. The discharge persisted. On December 1, 1944, a saucerization and muscle graft was performed in conjunction with penicillin therapy. Complete healing occurred on the twelfth day. Seven months later the wound broke down and discharged for two months. It then healed spontaneously and has remained healed for 2 months.

IV. *Bacteriological observations.*—Shortly after the beginning of penicillin therapy, the gross appearance of the discharge usually changed from a thick, purulent exudate to a thin serous one. In all instances, the amount of discharge diminished and in some instances ceased altogether. Repeated bacteriological cultures of those cases in which Gram-positive cocci only were recovered demonstrated that these organisms quickly declined in numbers and a few days after the beginning of penicillin therapy, negative cultures were obtained. Streptococci usually disappeared sooner than staphylococci. When the bacterial flora of the exudate contained a mixture of micro-organisms including Gram-negative bacilli, the Gram-positive cocci likewise disappeared rapidly, whereas the Gram-negative bacilli persisted unchanged in numbers as long as the wound remained moist. In some cases, it was felt that the persistence of these Gram-negative bacilli retarded the rate of healing.

Of the 14 cases of hæmatogenous osteomyelitis, 13 had *Staph. aureus* and one had *Strep. hæmo-*

lyticus as the causative organism. Secondary invaders occurred in four cases.

The initial bacteriological findings in relation to the end results of treatment are summarized in Table II.

TABLE II.
BACTERIOLOGICAL ANALYSIS OF INITIAL CULTURES
AND CLINICAL OUTCOME

Micro-organism	No. of cases	Healed	Unhealed
1. Staph.....	32	27	5
2. Strep. hæm.....	5	5	0
3. Strep. non-hæm.....	1	1	0
4. Strep. hæm. + Staph...	6	4	2
5. Strep. non-hæm. + Staph.....	2	1	1
6. Strep. hæm. + + Gram-neg. bacilli..	2	2	0
7. Strep. non-hæm. + Gram-neg. bacilli..	1	1	0
8. Strep. non-hæm. + Gram-neg. bacilli + Staph.....	1	0	1
9. Staph. + Gram-neg. bacilli.....	3	3	0
10. Unidentified Strep. + other organisms.....	4	2	2
	57	46	11

Toxic reactions.—It is well known that penicillin causes no serious toxic reactions. There are, however, certain preparations which have given rise to minor toxic effects. Several products used in this series gave rise to nausea, vomiting, chills, fever and in some cases, urticaria. By far the commonest complaint, however, was pain at the site of intramuscular injection which usually lasted for a period up to 30 minutes. This was found to be a fairly constant finding when the potency of the penicillin was below 200 units per milligram and was less frequent when potency was above 400 units per milligram.

DISCUSSION

It has been possible to follow 50 of the patients for 15 to 25 months. Of these, 9 are not healed, while 41 have remained completely healed for the following lengths of time: 24 cases for 15 to 23 months; 3 for 10 to 14 months; 2 for 5 to 9 months; 12 for 1 to 4 months.

In analyzing results of treatment, no attempt was made to differentiate the hæmatogenous from the exogenous type of infection. As far as could be judged, both types responded to treatment in a similar manner.

The pathological changes occurring in osteomyelitis (*e.g.*, necrosis, osteoporosis, or osteosclerosis) are due not only to the presence of bacteria but also to alterations in blood supply. Necrosis will result when the blood supply to the part is completely destroyed. This may be brought about by venous thrombosis, or by destruction of small periosteal arteries through the elevation of the periosteum by pus. Osteoporosis occurs when the infective process gives rise to a hyperæmia. Osteosclerosis is associated with an impairment of blood supply.

Since the effectiveness of any antibacterial agent in the blood stream is conditioned by the blood supply to the affected area, varying results are to be expected in a disease in which the pathological variations are so great. The first two case reports in this paper are spectacular examples of the effect of penicillin in patients in whom an adequate blood supply was still maintained to the infected area. The third and fourth case reports demonstrate the great improvement which can be expected when dealing with an infected bone whose blood supply is adequate in part. Enough sclerosis of bone without adequate blood supply was present however, to cause persistence of a slight discharge. The fifth case report is similar to the first two except that the healing was slower. This case might have done better if larger doses had been used.

In the remaining cases in this series, all showed lesions with necrosis. Accordingly, healing by an antibacterial agent carried by the blood stream could not be expected. In such cases, by far the largest number met in practice, the most important single factor in bringing about complete recovery is the removal by surgical procedures of tissue with no blood supply. This may not be possible at the first operation, but subsequent operations pursuing the same objective will bring about favourable results in many cases. The rôle of penicillin in this type of case has adequately been shown to reduce the infection in the tissues surrounding the dead bone.

It was found that when penicillin was used preoperatively, the amount of infection was greatly reduced. It was assumed that this method of treatment rendered operations safer; and, accordingly, more radical procedures were carried out. The continued administration of

penicillin after operation was believed to make the postoperative course uneventful and healing more rapid.

It is well known that patients suffering from chronic osteomyelitis may have quiescent periods in which there is complete freedom from symptoms for long periods of time. In this series of cases, five patients had been symptom-free for periods varying from 12 to 25 years. It is therefore, obvious that final assessment of the value of therapeutic methods cannot be made until the cases have been followed for many years.

SUMMARY

1. The effect of penicillin alone is described in cases of chronic osteomyelitis with sequestra, cavities or other conditions for which surgical procedures are usually carried out. The results were poor.
2. The effect of penicillin alone is described in cases which did not require operation or in which operation was contraindicated. Of five such cases, three are completely healed and two are greatly improved.
3. The effect of penicillin combined with surgical procedures is described. Of 52 cases, 43 are completely healed and 9 are unhealed. There were 24 cases showing recurrences following the first operation.
4. Results are given in 50 cases followed for 15 to 25 months.
5. It is recommended that penicillin be used in the treatment of chronic osteomyelitis. In most cases, its use should be combined with adequate surgery both before and after operations.
6. It is recognized that final assessment of treatment cannot be made for many years because of the nature of the disease.

This investigation was done under the direction of the Joint Services Penicillin Committee. Appreciation is expressed to Wing Commander R. F. Farquharson, Dr. P. H. Greey and Colonel R. I. Harris for their valuable help. I am indebted to Dr. Frieda Fraser, School of Hygiene, University of Toronto, for her aid in bacteriological studies; and to the many surgeons who executed or assisted in the operative procedures. Most of the cases presented were from the Orthopaedic department of Christie St. Hospital, Toronto, under the supervision of Dr. Gordon Dale.

Every evil leaves a sorrow in the memory except the supreme evil, death, and this destroys memory itself together with life.—Leonardo Da Vinci.

PENICILLIN SPRAY BY BULB ATOMIZER

By Frank W. Morse, M.D.

Lawrencetown, N.S.

WIDESPREAD use of penicillin in the home has been impossible because of technical difficulties with its past method of administration by the intravenous, intramuscular routes or, of late, the oxygen tank nebulizer. In other words, it has been necessary to take the patient to the penicillin instead of penicillin to the patient. The method outlined in this article overcomes these difficulties and therefore makes the effective use of penicillin in respiratory infections possible in the most remote areas.

This method has been used by a country general practitioner, in the patients' homes, on over 32 cases of respiratory infections with excellent results. In this series there were 8 cases of pneumonia, 2 cases of bronchiectasis with pneumonia, 3 cases of laryngitis, 13 cases of epidemic tracheo-bronchitis or "flu", 2 cases of sinusitis, 1 case of chronic otitis media. One case of postoperative atelectasis was also treated in this manner in a hospital.

The cases of "flu" all had a thick mucopurulent sputum which was difficult to expectorate. Most of them also had dullness and diminished breath sounds over the lower lobe of the left lung. These findings, together with the fact that many of the untreated cases developed a moderate pneumonia at this site, suggested that most cases had a degree of atelectasis. The most dramatic effect of penicillin spray is to "loosen" a tight cough with thick sputum. For these reasons, when atelectasis developed in a postoperative appendix on the third day, penicillin spray was given to him, with good effect. Such were the variety of diagnoses. The patients' ages varied from one child of 17 months with pneumonia, to a man of 76 who also had pneumonia. The other children treated were 3, 7 and 10 years of age. Admittedly, not every child of 17 months will take kindly to this method but, with an intelligent mother and child, it can be done. Most children regard it as a game. In this series there were two failures, both in women over 70 with fixed ideas as to the value of sulfa drugs. They both recovered, one with sulfadiazine the other with supportive treatment only.

The oxygen tank nebulizer method of giving penicillin is gaining general acceptance as it most certainly should. Its disadvantage is that hospitalization is necessary or nearly so. With penicillin used by atomizer it is neither necessary nor desirable to hospitalize the patient. This opens an important field in preventive medicine, since one can treat patients early and even prophylactically. If the patient is too sick to operate an atomizer, an attendant can do it.

The effect of penicillin spray generated by hand atomizer is the same as that reported in "power" operated nebulizers. Its most striking effect is in lessening and loosening the cough in 4 to 5 hours; if this is not accomplished in 12 hours one can be relatively certain the patient is not using the spray efficiently.

The strength of penicillin solution for use as a spray has practically unlimited range. Penicillin solution with a concentration of 250,000 units per c.c. has been nebulized and inhaled, as reported by Bryson *et al.* When it is realized that 18 c.c. of penicillin can easily be used from a bulb atomizer in a day, it is thus theoretically possible to give 45,000,000 units daily.

I have had eight atomizers in continuous use since January 1, 1946. When one case is through with an atomizer, it is easily cleaned with soap and water for the next case. Persons suffering from recurrent or chronic respiratory infections are advised to buy their own atomizers.

Boiled and cooled water was used entirely as the solvent for penicillin in this series.

In compound skull fractures, it is suggested that the nasopharynx and auditory canal could be rid of most pathogenic organisms by the use of penicillin spray, lessening the chances of a meningitis.

TECHNIQUE

Equipment needed.—One rubber-capped bottle of sodium penicillin (100,000 units). One 10 c.c. syringe and needle. A few ounces of sterile, cold, tap water. Two sterile 2 drachm vials and corks. Place these instruments in a covered pan containing one inch of tap water, boil three minutes and cool. Do not pour off water; use it for making the solution.

Preparation of stock solution.—Using syringe, add 10 c.c. of cold, sterile tap water to the

100,000 units bottle of penicillin powder and allow it to dissolve; this gives a concentration of 10,000 units per c.c. Darker brands of penicillin powder are not as good for inhalation as lighter ones; they seem to be a little more irritating, but this is not really important.

Penicillin for atomizer: From stock solution 1, withdraw 4 c.c. of solution and of this, place 2 c.c. in each of 2 sterile 2 drachm vials, then add sterile water up to the neck of vials and cork. This gives 40,000 units in 4 drachms.

ADMINISTRATION

Empty lungs thoroughly by exhaling strongly and slowly. Place atomizer tip in mouth just inside teeth and on beginning inhalation, press atomizer bulb; continue rhythmic spraying throughout inhalation then stop. Hold breath at full inspiration as long as possible, then exhale slowly and gently through the nose. Continue this for 10 minutes at beginning, then for 10 minutes in an hour, then every four hours when awake. It is important to exhale strongly to empty lungs before beginning spray, but after the first inhalation, do not expire too thoroughly since some penicillin spray may be blown out of the lungs. The important point is to hold the breath as long as possible at the end of the spray inhalation, thus allowing the penicillin to be deposited in the lungs and respiratory tract. Inhalation should be slow and not too deep, otherwise coughing may be started. If the patient is dyspnoeic, or there is some irritation on spraying, a few inhalations can be done without using the spray, then recommence the spray.

It is a mistake to use the atomizer too vigorously, since this gives a spray with large droplets which is not only inefficient, but liable to condense in the nose or on the soft palate, instead of going into the lungs. If penicillin condenses in the nose or throat, the natural impulse is to spit it out or swallow it. This wastes the penicillin. Wait a minute and the irritation disappears. If there is an accompanying sinusitis, spray as above, in alternate nostrils. The length of inhalation varies with each case and has to be worked out individually. The important thing is to get the 24 hour dose in 24 hours. In sinusitis (uncomplicated by laryngitis or tracheo-bronchitis), or otitis media, the amount of solution should be 2 dr. instead of the usual 4 dr. and breathing should not be deep.

ATOMIZERS

DeVilbiss No. 15 gives a fine spray but is not quite as portable as the next type. However, it is well made and is good for this method.

Atlas No. 82 (DeVilbiss made). This atomizer gives a slightly coarser spray and is cheaper than the one above. It is compact and portable and is perhaps the best for general use. This atomizer was the one most commonly used in this series.

Glaseptic atomizer. This type of atomizer gives the finest spray and therefore is very efficient. It has two main drawbacks: first, it is easily broken, since its main construction is drawn glass, and secondly, it is quite tedious to use because of the time needed to get the dose.

Precautions.—Penicillin must be kept cold or it loses its power. Freezing does not hurt it, but may break the container. Penicillin solution apparently keeps its strength about a week at refrigerator temperature. There is no danger from an over-dosage or any method of administration. Sulfa resistant bacteria are not penicillin resistant and vice versa.

DOSAGE

The question of dosage is not entirely settled at present, and of course no dosage is absolute but varies with the virulence of the infection and the patient's condition. My experience has been that an amazingly small amount of penicillin has been effective, but it must be remembered that this series of cases is small. It is possible to give at least 45,000,000 units daily with this method, which of course would never be indicated, and it is equally possible to give a minute dosage. Regarding the amount of solution given in 24 hours, I have always used 4 dr. (17 c.c.) but feel that at least double this amount could easily be used. Segal and Ryder advise for pneumonia, 25,000 units every 2 hours for 6 doses or more, then every 3 hours for 16 doses or more, both depending on the clinical response. They also report excellent results in patients with bronchiectasis and lung abscess.

Vermilye is somewhat obscure as to this dosage, but for one type XX pneumonia he gave 40,000 units 4 times daily for a week, then twice a day for 2 weeks.

My experience has been that the following doses, though small, have been effective and will be continued until it is shown that they are not adequate.

The following amounts of penicillin are 24 hour dosages and this dosage is to be divided

into 4 hourly doses by the patient while using the atomizer. This is easily done by placing the 24 hour amount in the atomizer and gauging the amount used by means of 4 adhesive strips on the outside of the bottle. All these doses are dispensed in 4 drachms of water excepting uncomplicated sinusitis, sore throat and otitis media, when 2 dr. are used. The total dosage varies with the clinical response, but the usual period for treatment is 4 to 6 days.

Pneumonia.—(a) Severe, 24 hour dosage, 100,000 units, spray every 4 hours. (b) Moderate, 24 hour dosage, 60,000 units, spray every 4 hours. (c) Mild, 24 hour dosage, 40,000 units, spray every 4 hours.

Bronchitis.—(a) Severe, 24 hour dosage, 60,000 units, spray every 4 hours. (b) Moderate, 24 hour dosage, 40,000 units, spray every 4 hours.

Sinusitis, laryngitis, tonsillitis and otitis media: for these conditions 2 dr. of water containing dosages similar to bronchitis is advised and inhalation is only gentle.

The most severe case in my series was that of a farmer of 76, with broncho-pneumonia which did not respond to sulfadiazine. He received 400,000 units of penicillin in 6 days and responded rapidly to this.

SUMMARY AND CONCLUSION

Penicillin spray produced by hand atomizer, was used by 30 patients with various respiratory infections. Observations on this series of cases suggests that the use of penicillin spray from a hand atomizer is effective in respiratory infections. The method is easy, inexpensive and just as generally applicable as sulfonamide therapy, yet has no dangers. This method warrants further trial on a larger number of cases. The most striking effects of aerosol penicillin are lessening cough, sputum and toxicity.

The following conclusions may be deduced from this series of cases:

1. Penicillin spray generated by a hand or bulb atomizer is effective in many respiratory infections, including those of the naso pharynx.
2. Penicillin spray by atomizer is a cheap, safe, painless method which is generally applicable to home use by untrained personnel, and offers great possibilities for preventive medicine.

The dosage of penicillin spray is not definitely determined, but in the above series, small doses were efficient.

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CONTUSION OF THE HEART*

By C. F. Moffatt, M.D., F.A.C.P.

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IN these days of steadily rising numbers of motor accidents, there has been a noticeable increase in the incidence of injuries to the chest from violent contact with either the steering wheel or some other part of the automobile.

While the great majority of such victims complain of chest pain immediately after the accident, a certain proportion present no localizing symptoms until a varying period of time after. To further confuse the picture, there is another type of patient who obviously has sustained very slight injury, but a short time later presents a symptom complex suggesting the result of a previously existing cardiac abnormality which has become prominent due to the circumstances associated with the accident.

Such accident cases are assuming added importance when considered from a medico-legal point of view, often with considerable embarrassment to the medical witnesses called into the inquiry. It is with this often difficult situation in mind, that the following case histories are presented, in the hope that they may help towards a clearer insight into the present confusion. These two apparently similar yet radically different cases illustrate well two types often met with in a discussion of contusion of the heart.

CASE 1

Mr. W., aged 62, was admitted August 26, 1944, to the Neurological Division, Royal Victoria Hospital, to the service of Dr. William Cone, 26 hours after a motor accident. I am greatly indebted to Dr. Cone for permission to use his records and to report details of this interesting case. This patient entered hospital in a very serious state of shock, complaining mostly of pain over the sternal region of the chest; he also had injuries in other parts of the body, which had been bruised and fractured in the upset.

He was pale and weak but still conscious. The pulse was fast and thready, 120 per minute, the blood pressure 80/60 mm. Hg. The heart sounds were rapid, difficult to hear and lacked differentiation. However, he was too weak to permit of any extensive examination. In addition to the complaint of pain over the sternum and left side of the chest on breathing, swallowing produced a deep-seated retro-sternal pain, which lasted about one week. Bony crepitus was obtained over the ribs of the left side in the anterior axillary line.

Immediate steps were taken to combat shock. Very little could be done to treat the multiple fractures, except to make him as comfortable as circumstances permitted. He had a fracture of the right frontal bone penetrating into the frontal sinus, fracture of the nasal bones, fracture of the left mandible, fracture of the right radius at the wrist and two fractures of

the sternal bone, and if that were not enough, fracture of the third, fourth and fifth ribs on the left side in the anterior axillary line: also multiple hematomata and abrasions of the lower extremities.

Two days following the accident, a more thorough examination was possible, and revealed signs of a small pneumothorax over the left upper chest and the presence of a small amount of fluid at the base of the left pleural cavity. The blood pressure was alike in both arms and low, 98/70 mm. Hg. The heart sounds were poorly differentiated and heard with difficulty; there were no audible murmurs, no arrhythmia, no pericardial friction, but examination suggested a pericardial effusion. There was still some remaining shock and he was very uncomfortable.

When his condition permitted, a few days later, x-ray examination of the chest showed the heart to be enlarged to the left in comparison with plates which had been taken in 1943. There was also an increased density over the base of the left lung, suggesting either a compressed lung base or a small collection of fluid. The clinical signs were those of fluid.

He was under the immediate care of the surgical staff from August 26 to October 3. The temperature was elevated for three and a half weeks, 102° on admission gradually subsiding to 99°. There was also an acute exacerbation of fever on September 20 due to an acute pyelitis, which responded well to treatment.

In this same interval of time the blood pressure remained low, only on isolated occasions reaching 110 to 114 mm. Hg. systolic; usually it was under 100 systolic and a diastolic ranging between 60 and 70 mm. As time went on the character of the heart sounds improved, and his general physical condition became stronger.

From October 3 to October 27, he was under medical supervision and progressed satisfactorily, complaining only of a slight pain or tightness across the precordium; the blood pressure had risen to a level of 110/70. By October 14, forty-nine days after the accident he was allowed up in a chair, and nine days later was discharged in good condition.

In his past history, there was one important point. In November 1943, during an admission to hospital for a check-up, he showed a blood pressure of 140 systolic and 80 diastolic. An x-ray plate of the chest at that time showed a slightly elongated aorta with the heart of normal size and the lung fields clear, except some slightly increased bronchovascular shadows. The electrocardiogram at that time showed an essentially normal tracing (Fig. 1).

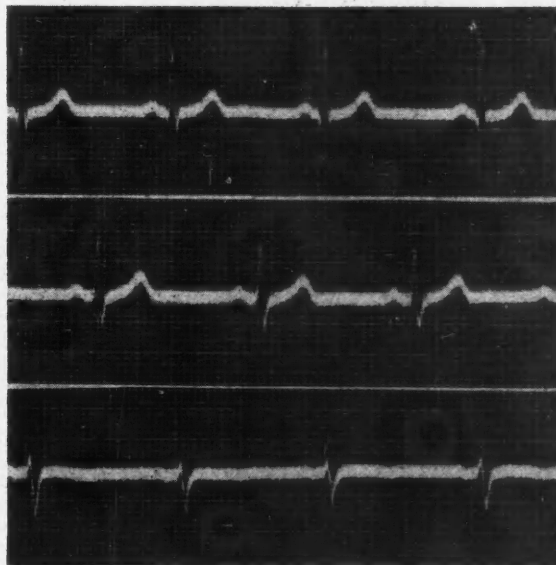


Fig. 1. (Case 1).—Taken November, 1943, during the course of a general examination.

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The findings recorded in 1943 serve as a good standard by which we can judge those found on examination after the accident. In view of the direct trauma to the præcordium with resulting fractures of both ribs and sternum, acute damage or contusion of the heart and its surrounding membranes is likely.

This is substantiated by the series of electrocardiograms which are so typical of damaged myocardium (Figs. 2, 3, 4, 5). The persistently low blood pressure, present up to the time of his discharge from hospital was also a significant feature.

At the time of a routine examination made on admission to hospital and up until the tenth day after entry, there was nothing unusual noted about his circulation. There was no cyanosis; the pulse was regular at an average of eighty per minute; the blood pressure was maintained at 120 systolic and 80 diastolic; no enlargement of the heart could be made out, the heart sounds were clear, free of murmurs or friction sounds.

His temperature, normal on admission, rose to 101° on the second day, then quickly subsided to normal in two days and remained so to the end. No electrocardiogram was done on admission. X-ray examination confirmed the diagnosis of fracture of the third, fourth and fifth ribs in the left anterior axillary line, and the heart shadow was not enlarged.

It is of passing interest to note that on account of a condition of furunculosis a blood sugar curve was done two days after admission and showed a high curve with glycosuria; five days later this had returned to normal.

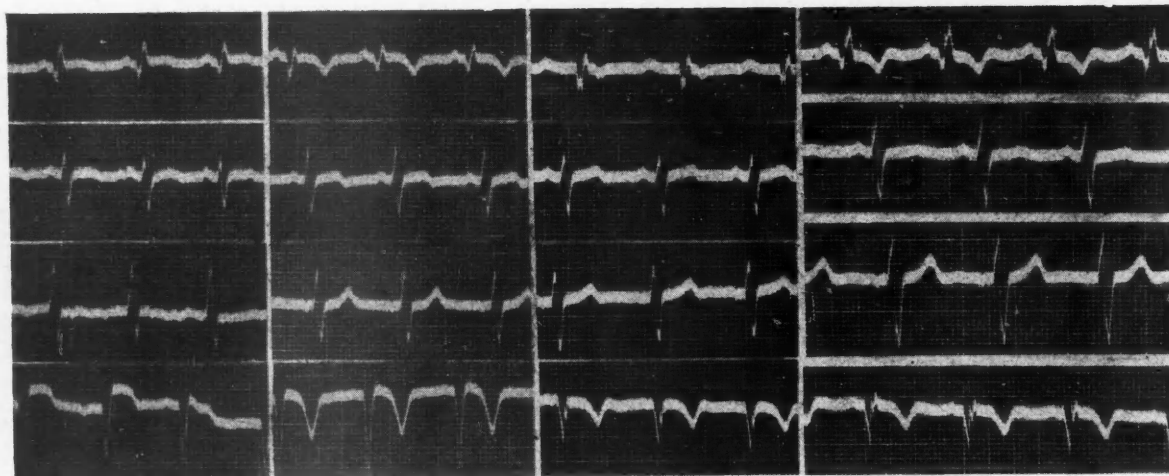


Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 2.—August 28, 1944. Shows an elevated R/T interval in leads 1, 2 and CF 4; well marked Q waves in leads 1 and 4. Fig. 3.—September 13, 1944. In lead 1, the T waves have now become negative and in leads 2 and 3 are becoming positive; large Q waves and negative T waves in CF 4. Fig. 4.—October 25, 1944. The QRS complexes are now more definitely slurred. Lead 1, the T waves are less inverted and more definitely positive in leads 2 and 3. Lead CF 4 shows smaller Q and less inverted T waves. Fig. 5.—July 23, 1945. The patient still has occasional præcordial distress and symptoms of myocardial insufficiency, and is much restricted in his activities.

The second case serves as a very good example of the difficulty which might arise in patients presenting a history of direct injury to the chest, arousing the suspicion of a contusion of the heart, yet proved otherwise at autopsy.

CASE 2

This patient was a man of 45, a stable groom, who, in the course of his duties, was kicked in the chest by a horse, knocked down unconscious for a short period and was then able to get up and proceed to his home a short distance away. He was admitted to hospital one and one-half hours later, November 3, 1944. On admission there were no definite marks of external trauma, but he complained of considerable distress and pain over the left side of the chest, especially on any attempt to breathe deeply. The movements of the left side of the chest were greatly restricted and there were signs of fracture of the third, fourth and fifth ribs in the anterior axillary line.

His previous history revealed nothing relevant to his present condition. His exercise tolerance was good and he denied any previous præcordial distress which might have had a bearing on the condition found at autopsy.

He was well enough to be out of bed three days after his admission.

On the morning of his tenth day after admission, he complained of a sense of weakness in his left arm and severe substernal pain radiating up from the epigastrium to the left shoulder. There was no change noted in his pulse or temperature, but the blood pressure dropped to 110 systolic and 62 diastolic. Nothing unusual was noted about the examination of the heart, there was no change in the character of the heart sounds, no endocardial murmurs, no friction sounds.

On the following day, November 14, there was a return of the severe præcordial pain—four attacks in all—differing only from that of the previous day in their duration and severity. He died within fifteen minutes during the fourth attack.

An electrocardiogram taken the day of his death (Fig. 6) revealed a rather typical tracing of an acute interference with the anterior descending coronary artery circulation with early infarction. The unusually high R/T elevation seemed to justify the diagnosis of infarction.

POST-MORTEM FINDINGS

There were no visible signs of any external injury to the pericardium or myocardium; there was a moderate dilatation of the right heart. The heart weighed 365 grams.

The ascending aorta showed moderate sclerosis and the anterior descending branch of the left coronary artery showed marked sclerosis with narrowing and calcification. Near its origin, the lumen of this artery contained a small amount of soft reddish unorganized clot, which in the opinion of the pathologist was not more than forty-eight hours old.

Histological section revealed recent unorganized thrombus material which occluded the lumen of the vessel. Section of the musculature supplied by this vessel showed slight oedema and fragmentation of the muscle fibres. Death had occurred before a definite necrotic appearance of the myocardium had time to develop.

In addition, a small amount of blood-tinged fluid was found in the left pleural cavity with organizing adhesions of the left pleura beneath the fractured ribs on the left side. Passive congestion of the lungs and kidneys was noted.

I am indebted to the Department of Pathology, Royal Victoria Hospital, Montreal, for permission to publish these details.

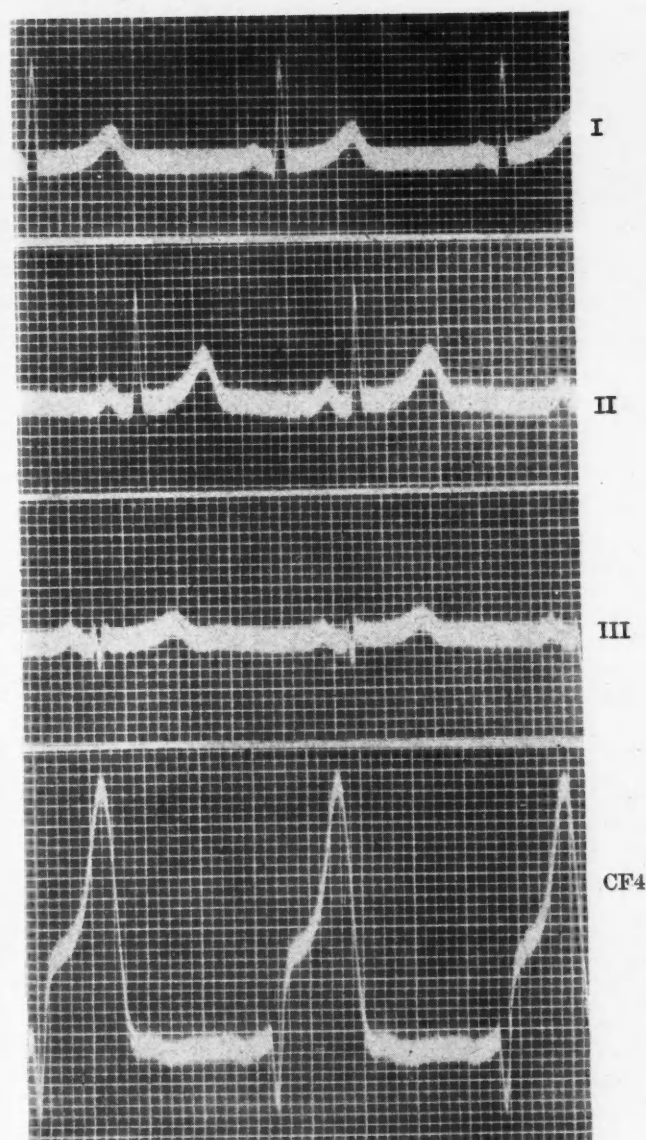


Fig. 6. (Case 2).—November 14, 1944. Note the unusually high R/T intervals, associated with very early myocardial changes.

DISCUSSION

It seems advisable to group these two cases together because they have many features in common and resemble one another superficially but differ essentially in their course and pathology. The first patient, we believe, illustrates from a clinical point of view all the features necessary to a diagnosis of contusion of the heart; direct trauma to the chest, shock and prolonged circulatory collapse slowly improving; and electrocardiographic changes typical of injury to the circulation over the anterior surface of the heart.

The electrocardiogram taken after the accident contrasts sharply with that taken in 1943 and continues to progress towards normal, keeping pace with the patient's general improvement.

The second case history illustrates very well a combination of events which might lead to confusion and false deductions if post-mortem findings were not available. There is a history of trauma to the chest, resulting in fractured ribs. There follows an interval of ten days, during which period the patient makes uninterrupted progress, then the onset of severe anginal pains associated with coronary thrombosis and death.

It is the lapse of time intervening between the accident and death which should be particularly noted. It is frequently argued that symptoms of cardiac injury may not appear for a varying period of time after the chest injury. However, in view of the pathological findings in this instance, it is unlikely that there was any relation between the accident and the subsequent myocardial infarction. It may be argued that the chest trauma was a factor in initiating a coronary occlusion in a patient already predisposed to such an event by the presence of coronary sclerosis. But that a fresh occlusion occurring 10 days later should be related to the chest injury does not seem probable.

It is also of particular interest to compare the very early changes in the myocardium, detectable only on histological section, with the well marked changes in lead CF 4 of the electrocardiogram.

SUMMARY

Two cases of injury to the chest wall are presented which appear to resemble one another in their main features, but differ

fundamentally in their underlying pathological factors.

The first patient presents all the necessary clinical evidence for a diagnosis of contusion of the heart.

The second case history illustrates the possibility of error in assuming that with a history of injury to the chest, subsequent events were the result of the accident and not due to natural causes.

Drummond Medical Building.

RÉSUMÉ

Deux cas de traumatisme thoracique sont présentés. L'étude clinique des deux est assez similaire mais l'examen post-mortem de l'un d'eux vient bien établir les différences fondamentales qui les distinguent. Chez le premier cas il s'agit d'une contusion cardiaque suivie de guérison. Chez le second le même diagnostic était très vraisemblable mais la mort inopinée du malade permit le diagnostic anatomique de thrombose coronarienne. Dans ce dernier cas, la relation de cause à effet entre le traumatisme et la mort est difficile à établir avec certitude; tout au plus peut-on invoquer l'hypothèse de l'action précipitante du traumatisme.

JEAN SAUCIER

TOXÆMIA OF PREGNANCY*

By Simon Gold, M.Sc., M.D.†

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THE study of toxæmia of pregnancy offers many interesting approaches. The classification of the toxæmias for many years was confused by a complicated terminology in the literature. Today there is one accepted classification that has contributed largely to a clear understanding of the problem. The classification, along with a discussion of the etiology and significance of œdema in pregnancy, the rationale of treatment and the interpretation of four representative cases treated at the Royal Victoria Maternity Hospital will be presented.

CLASSIFICATION

Toxæmia of pregnancy is a disease that usually occurs during the last trimester of pregnancy. The syndrome includes both pre-eclampsia and eclampsia and may leave serious late effects on the renal and cardiovascular

systems of the mother. The severe form of the disease jeopardizes the lives of the mother and the fetus.

Toxæmia of pregnancy is characterized by excessive gain in weight, usually associated with œdema, hypertension, albuminuria and symptoms referable to the central nervous system. Symptoms of the renal, gastrointestinal and visual systems also appear. The symptoms and signs appear in various combinations and regress rapidly following delivery. Eclampsia is reserved for those cases in which convulsions occur, and pre-eclampsia for the non-convulsive disease. In some instances convulsions occur following delivery, *i.e.*, post-partum eclampsia.

Severe toxæmia reflects a serious prognosis both for mother and child. Ultimately there is the possibility that persistent hypertension may supervene.

Convulsions in pregnancy are not necessarily pathognomonic of eclampsia. Diseases not related to pregnancy may be responsible for convulsive seizures, *e.g.*, convulsions of hysterical, epileptic and cerebrovascular origin, yellow atrophy of liver, uræmia and cortical necrosis of the kidneys.

Hypertension and albuminuria observed during pregnancy are not diagnostic of toxæmia. Toxæmia of pregnancy usually develops in persons with no previous cardiovascular or renal disease, but it is possible for toxæmia to be superimposed upon a pre-pregnant hypertension or old cardiovascular or renal disease. All diseases of the kidney associated with elevated arterial pressure predispose to toxæmia of pregnancy.

Numerous classifications have been suggested for the different syndromes in pregnancy characterized by hypertension, œdema and proteinuria.

The American Committee on Maternal Welfare has suggested the following classification of the toxæmias of pregnancy which has been adopted by many obstetric clinics:

Group A. Diseases not peculiar to or dependent upon pregnancy.

- I. Hypertensive disease (hypertensive cardiovascular disease):
 - (a) Benign (essential hypertension); mild; severe.
 - (b) Malignant.
- II. Renal disease:
 - (a) Nephrosclerosis or chronic vascular nephritis.
 - (b) Glomerulonephritis: acute; chronic.
 - (c) Nephrosis: acute; chronic.
 - (d) Other forms of severe renal disease, *e.g.*, chronic pyelonephritis.

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Group B. Diseases dependent on or peculiar to pregnancy.

- I. Pre-eclampsia: mild; severe (preconvulsive).
- II. Eclampsia: Convulsive; nonconvulsive (i.e., coma with findings at autopsy typical of eclampsia).

Group C. Vomiting of pregnancy.

Group D. Unclassified toxæmias.

THE ETIOLOGY AND SIGNIFICANCE OF ŒDEMA

The clinical importance and interpretation of generalized œdema in pregnancy without hypertension and albuminuria has received little attention,¹ while its relationship to toxæmia of pregnancy has long been recognized. In 1919 Zangemeister² described the phenomenon of generalized œdema in pregnancy and explained the clinical picture of toxæmia on the basis of water retention. It has been stated that in the absence of hypertension and albuminuria eclampsia did not occur.³ Today we recognize the important fact that anasarca or generalized œdema may be the only warning sign before a convulsion.⁴

Sixty-five per cent of all pregnant women show some œdema during their pregnancy.^{1, 3} Once œdema appears it persists or may regress at any time either spontaneously or in response to the proper treatment. A diuresis begins in normal women in almost every case about twenty-four hours after delivery⁵ and œdema usually disappears within five days following delivery.

Many theories have been postulated in an attempt to explain pregnancy œdema. These are summarized briefly:

1. Anselmino and Hoffmann⁶ and Levy-Solal⁷ suggested that excess posterior pituitary secretion was responsible for the œdema.
2. Potens⁸ thought that the enlarged uterus exerted pressure on the ureters.
3. Strauss,⁹ Barath and Weiner¹⁰ and Rona¹¹ believed that increased hydrostatic pressure in the capillaries was responsible for œdema.
4. Eastman^{12, 13} and Strauss¹⁴ strongly supported the theory of hypoproteinæmia.
5. Eufinger¹⁵ suggested the theory of plasma colloid instability.

The exchange of fluid between the blood stream and the tissues is under control of (a) the hydrostatic pressure of the blood in the capillaries which tends to force fluid out of the blood stream into the tissues; (b) the plasma colloid osmotic pressure which tends to draw fluid into the blood stream. The blood pressure in the arterial portion of the capillaries exceeds the colloid osmotic pressure of the serum proteins, thus forcing fluids and salts out into the tissue spaces. As the blood passes through the capillaries the hydrostatic pressure decreases and the concentration of serum protein increases due to

the loss of water. In the venous portion of the capillaries the colloid osmotic pressure exceeds the capillary pressure and fluid and salts are absorbed from the tissue spaces. The normal exchange of fluids between the blood stream and tissues is thus a result of a fine balance between the hydrostatic pressure of the blood and the colloid osmotic pressure of the serum proteins.

If the colloid osmotic pressure of the serum proteins is less than 20 cm. of water, œdema may occur. Such a low pressure is usually associated with a serum protein concentration of less than 5.5 gm. %. The average serum protein concentration in nonpregnant women is 7.5 gm. %. In normal pregnant patients the average is 6.5 gm. %.¹⁶ The serum protein concentration decreases in pregnancy reaching a minimum at thirty weeks.¹⁷ This decrease in concentration is due primarily to a decrease in albumin. The globulin concentration remains constant or may increase somewhat. The decrease occurs regardless of diet or the amount of protein ingested, however if the diet is deficient in protein, the decrease in total protein concentration may approach pathological levels. The average concentration of serum albumin in nonpregnant individuals is 4.4 gm. %, as compared with 3.7 gm. % for normal pregnant patients. The average serum globulin in nonpregnant individuals is 2.7 gm. %, as compared with 2.9 gm. % for normal pregnant patients. The mean figures for serum protein concentration in eclampsia and pre-eclampsia are 6.22 and 6.36 gm. % respectively.¹⁶

Other factors that may produce œdema are anæmia,¹⁸ vitamin B¹⁹ deficiency and prolonged anoxæmia. Normally, capillary endothelium is impermeable, but if injured, protein will leak out and produce œdema.²⁰

It is generally recognized that œdema of pregnancy is not associated with increased hydrostatic pressure, capillary permeability to protein, anæmia and vitamin B deficiency.¹¹

In toxæmia there is a disturbance of water metabolism which involves the retention of water in the tissues and the blood stream. Thompson *et al.*²¹ have shown that the plasma volume increases in pregnancy up to 65% above the normal nonpregnant level. Dieckman and Wegner¹⁷ studied the serum proteins in relation to the increased plasma volume in pregnancy and found that the protein was increased by 18% at term above the normal nonpregnant level, but since the plasma volume was increased to a

greater extent, there was an actual decrease in the concentration of protein. Similarly, Oberst and Plass²² attributed the hypoproteinæmia and the anæmia of pregnancy to hæmodilution from increase in water content of the blood. Thus it would appear that the lowered protein was the result rather than the cause of water retention. Contributing factors to the lowered protein may be dietary deficiencies, albuminuria and fetal demands. Today it is not generally believed that eclampsia and pre-eclampsia are due to hypoproteinæmia.^{16, 23} Oedema in most cases is not due to hypoproteinæmia.¹⁶

Chesley and Chesley^{24, 25} believe that rapid or excess weight gain often points to water retention which may be a harbinger of pre-eclampsia. Extracellular water is estimated by administering sodium thiocyanate orally. Chesley and Chesley report that the thiocyanate water is roughly equivalent to the extracellular water. Patients with excess available water, but clinically normal, had a 19.96% incidence of toxæmia. In a report on 1,388 patients, measurements were made after the thirtieth week. Each patient was given 1,000 mgm. of sodium thiocyanate in fruit juice by mouth. All the urine was saved for twenty-four hours and then a blood sample was taken. Thiocyanate was determined by the Evelyn photocolormeter. The incidence of pre-eclampsia was six times greater in women with excess extracellular water than in those with normal extracellular water. They did not think that the test was specific inasmuch as 80% showing excess available water did not develop eclampsia.

Kaltreider and Meneely²⁶ used radioactive sodium to determine the extracellular fluid. The range for the sodium space was 23.29%. The proportion of available extracellular water is 33 to 37% in pregnancy, as compared with 20 to 26% for the average nonpregnant female.^{24, 25} The retention of sodium parallels that of water. There is a positive balance of this ion during the latter months of pregnancy.²⁷ Part of this is attributed to the needs of the fetus, but there is also an altered capacity for excretion.

Thorn, Nelson and Thorn²⁸ found that the retention of sodium and water precedes menstruation, and Thorn and Engel²⁹ reported that the injection of oestrogen and progesterone in dogs led to sodium and water retention. Taylor, Warner and Welsh³⁰ investigated the relationship of the oestrogens and progesterone to the oedema of normal and toxæmic pregnancy. They

found that the average sodium loss in the first ten days postpartum in normal pregnancy was 4.89 gm. and in toxæmia cases 17.34 gm. Giving 200 mgm. of progesterone to toxic cases led to a retention of 3.77 gm. of sodium.

Whenever oedema forms, mineral salts, especially sodium, must be present. Administration of large amounts of sodium leads to water retention in normal individuals.³¹ Salt retention is an important factor in the production of oedema. For example, the administration of sodium chloride to the patient on the verge of oedema precipitates the condition. The oedema disappears again upon a salt free diet. Sodium bromide has a similar effect, while chlorides, other than sodium chloride (*e.g.*, potassium chloride and ammonium chloride), exert no effect or, through their acidifying effect, cause a diuresis. It thus appears that the influence upon the production of oedema is exerted by the sodium ion.

THE RATIONALE OF TREATMENT

The recognized prenatal care of pregnant patients includes routine examination of weight, blood pressure, urine and search for the signs of oedema. The prophylactic treatment consists in recognizing those patients in whom toxæmia is prone to occur, *i.e.*, those with pre-pregnant hypertension. Oedema is preventable by maintaining an adequate nutrition with 100 gm. protein per day and by use of the salt free diet during the latter half of pregnancy. Soda and sodium-containing preparations should not be used for heart burn. Milk of magnesia or amphojel should be prescribed in the treatment of these symptoms. Ammonium chloride or potassium chloride in 2 gm. doses daily and non-sodium salts, such as magnesium sulphate, by mouth are effective in promoting the loss of oedema.

The main features in the treatment of pre-eclampsia and eclampsia are: (1) bed rest; (2) adequate sedation; (3) the production of water elimination by purges, restriction of salt and sodium in the diet and the use of hypertonic glucose solutions in water intravenously.

In mild pre-eclampsia sedation is produced by small doses of phenobarbital, gr. $\frac{1}{2}$ three times a day and bed rest. In moderate pre-eclampsia, luminal sodium, gr. v every eight hours or morphine, gr. $\frac{1}{4}$ are useful. Intramuscular magnesium sulphate is indicated in severe pre-eclampsia and eclampsia. Ten c.c. of

a 25% solution is given every four hours if necessary.

The effect of parenteral magnesium on the nervous system and cardiovascular system is important. The anæsthetic effect of parenterally administered magnesium salt was demonstrated by Meltzer and Auer³² in 1905. The use of magnesium salts in eclampsia since Alton and Lincoln³³ has gained increasing importance because magnesium is a powerful vasodilator and produces a decline in blood pressure.

THE IMPORTANCE OF DIET

Diet is of great value in the control of pre-eclampsia. Daily fluid intake is maintained at 2,500 to 3,000 c.c.^{43, 44} During the first twenty-four hours the patient is kept on a milk and water diet. Diet for the second twenty-four hours is the liquid or No. 1 toxic diet which is

neutral ash and salt free. It is made up of orange juice, egg-nogs, chicken broth, lemon water ice, milk shakes, beef and tomato juice and jellies. On the third day the patient is placed on the No. 2 toxic diet which is also neutral ash and salt free and contains 100 gm. protein, 200 gm. carbohydrate, 80 gm. fat and has a total value of 2,160 calories. If the patient does not respond to treatment, as evidenced by a failure of diuresis or by maintained or rising blood pressure, evacuation of the uterus must be considered. If hypertension and albuminuria persist for three weeks, termination of pregnancy is imperative as a safeguard against the development of permanent postpartum hypertension. The method by which pregnancy is to be terminated depends on, the type of pelvis and presence of disproportion, and the condition of the cervix. The less trauma the

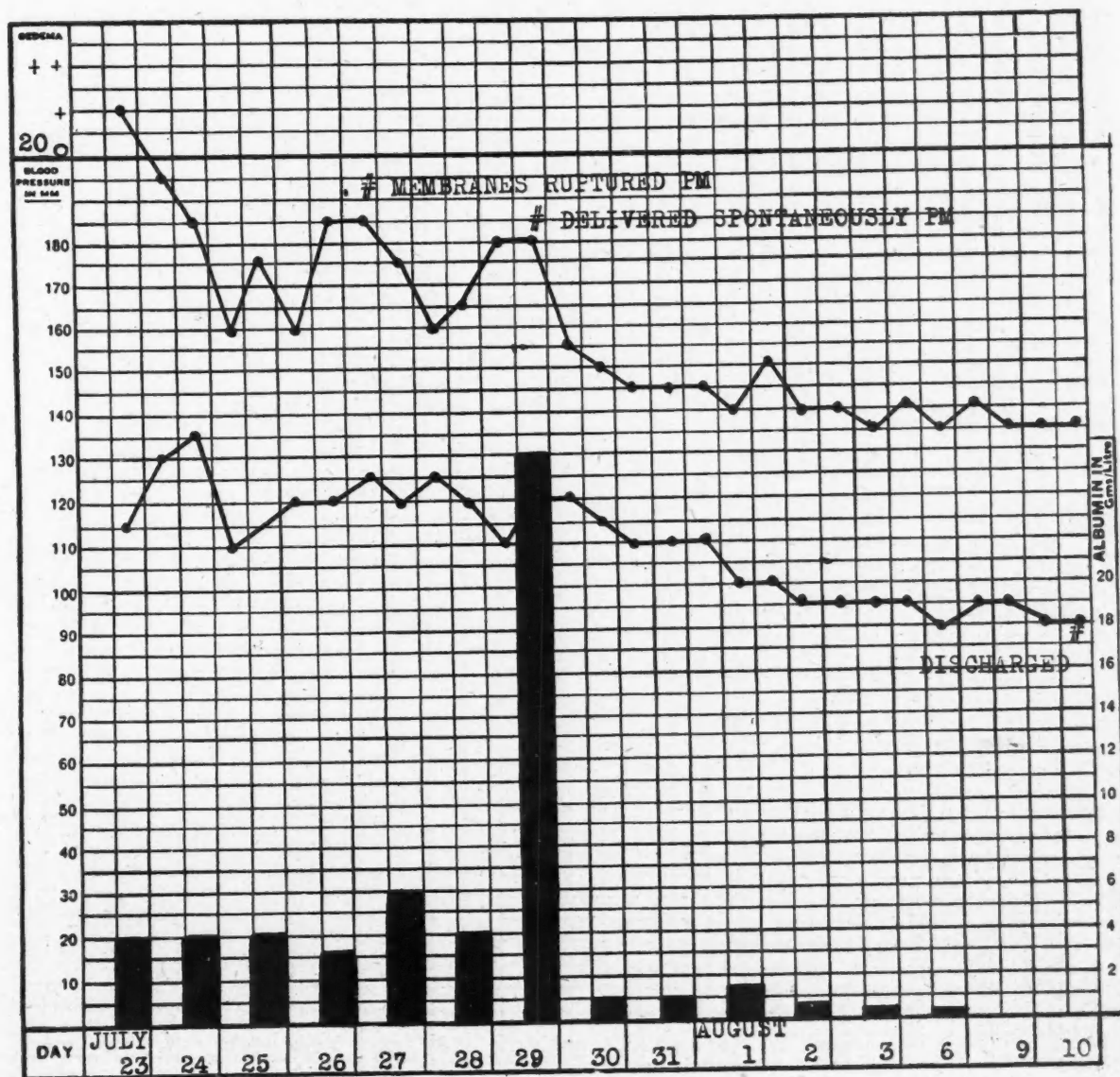


Fig. 1. (Case 1).—Pre-eclampsia severe.

better the result because the patient is usually a poor operative risk. Most cases can be successfully treated by simple rupture of the membranes or by bag induction. Cæsarean section and accouchement forcé, with certain exceptions, should be avoided.

The treatment of two pre-eclamptic and two eclamptic patients will be presented.

CASE 1

M Mrs. L.P., para. 3, aged 33, was admitted seven months' pregnant with complaints of headaches and dizziness of two weeks' duration and œdema of one week's duration. Significant points in her past history were that she had scarlet fever at seven years of age and pre-eclampsia with her three previous pregnancies in 1935, 1937 and 1940. The last pregnancy was terminated two weeks from term. All three children are alive and well. She first attended the clinic at the Royal Victoria Montreal Maternity Hospital when she was two months pregnant. Her prenatal course was normal until July 23, 1945, when she came to the clinic

complaining of headaches and dizziness. Her blood pressure was 210/116, there was slight dependent œdema and the urine boiled solid on testing for albumin. Quantitative estimation of albumin revealed 4 gm. per litre.

She was immediately placed on a strict toxic regimen. Investigations revealed a hæmoglobin of 86%, red blood cells 4,680,000, Rh factor positive, blood group B. Blood uric acid was 6.45 mgm. %. (The average blood uric acid in fifty normal pregnancies at the Royal Victoria Montreal Maternity Hospital was found to be 2.36 mgm. % with a range of 1.9 to 3.5 mgm. %.) Non-protein nitrogen was 28.4 mgm. %, carbon dioxide containing capacity 48.2 vol. % and total protein 6.23 gm. %. The Mosenthal test showed a variation in urinary specific gravity from 1.010 to 1.020. The concentration test showed a concentration to a specific gravity of 1.024. Fundi were normal. The graph (Fig. 1) shows the record of blood pressure which was taken every two hours. After four days of observation and treatment there was insufficient improvement to warrant carrying the pregnancy any further. She was therefore examined and the cervix found to be 2 cm. open but not effaced. The membranes were artificially ruptured. Labour began spontaneously after forty-eight hours and lasted nine hours. Parturition was spontaneous LOA.

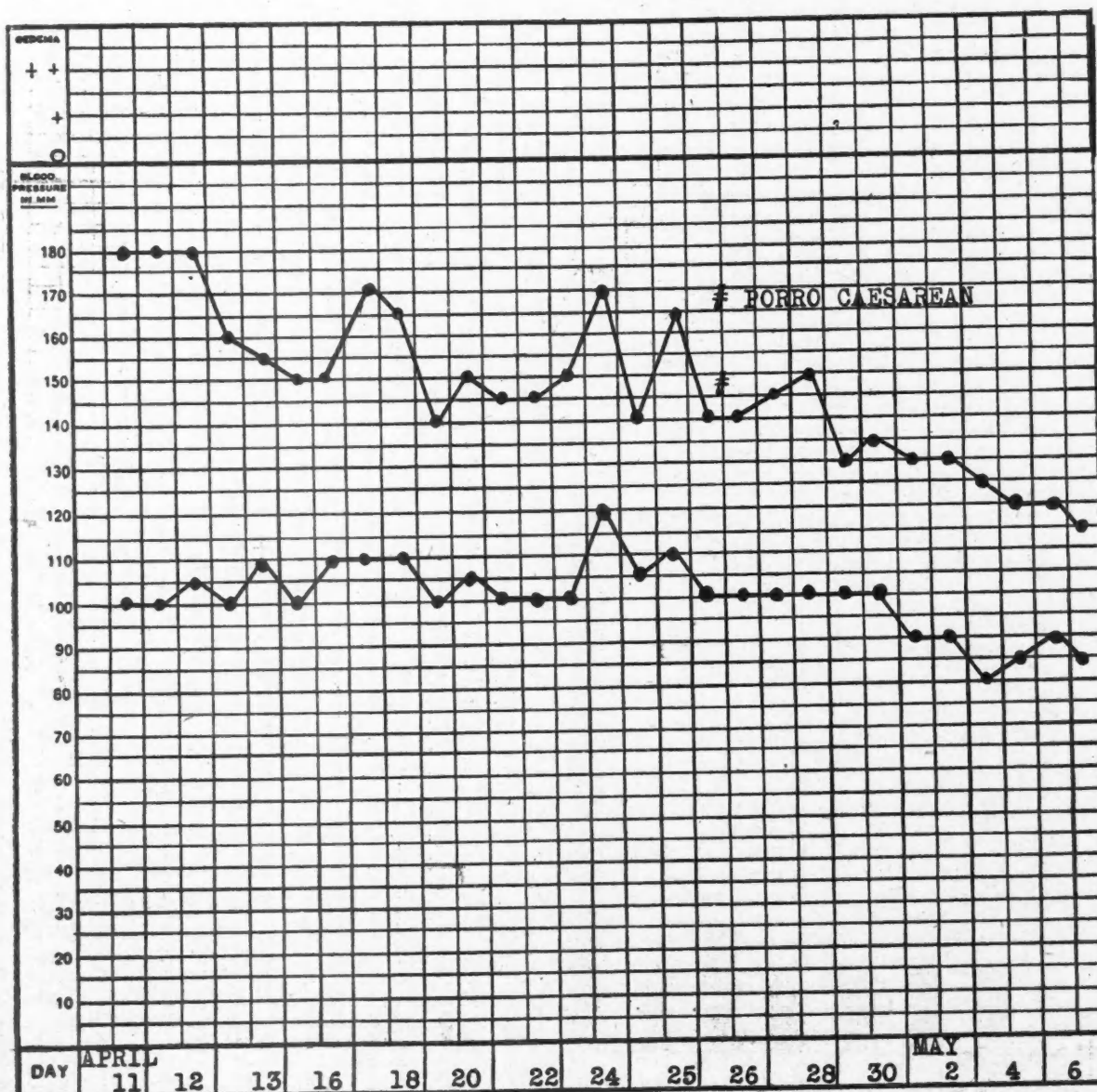


Fig. 2. (Case 2).—Pre-eclampsia.

It is interesting to note that on the day of delivery the urine contained 26 gm. of albumin per litre. Post-partum course was afebrile. On August 8, a repeated blood chemistry showed a blood uric acid of 4.14 mgm. %, serum uric acid 6.10 mgm. %, creatinin 0.69 mgm. %, non-protein nitrogen 22.1 mgm. %, total protein 7.15 gm. %. Six weeks after discharge from hospital this patient had a normal urine, a blood pressure of 120/80 and did not show any damage to her cardiovascular system.

CASE 2

The second patient, Mrs. A.B. (Fig. 2), a para 0, aged 41, was admitted seven months' pregnant with complaints of vomiting, blurring of vision, oedema, weight gain and severe headache of one week's duration. Significant points in her past history were the fact that she had measles as a child and tonsillitis at 36 years of age. She first attended the clinic when ten weeks pregnant and had careful prenatal care. Her prenatal course was normal until April 11, 1945, when she was seven months pregnant. She was admitted with a blood pressure of 180/100 and the symptoms and signs mentioned above and placed on a strict toxic regimen.

Investigations revealed a hæmoglobin of 92%, red blood cells 4,750,000, Rh positive, white blood cells 5,700, platelets 210,000, bleeding time 1½ minutes, prothrombin

time 36 seconds, fibrin time 1 minute, 55 seconds, complete coagulation time 8½ minutes. Rumpel Leede test was negative. The urine boiled solid and showed many granular casts and some red blood cells and white blood cells. The Mosenthal test showed a day to night volume ratio of 740/275 c.c. and a variation in specific gravity from 1.020 to 1.025. The concentration test showed an ability to concentrate to a specific gravity of 1.028. Blood chemistry revealed a blood uric acid of 4.7 mgm. %, serum uric acid of 5.7 mgm. %, non-protein nitrogen 22.1 mgm. %, total protein 5.9 gm. %. Examination of the fundi revealed no hæmorrhages or exudates and normal nerve heads and maculæ. The arteries, however, were narrow, especially those passing to the nasal side and many showed a "copper wire" appearance. The electroencephalogram was normal.

In spite of rigid treatment there was a tendency for the diastolic blood pressure to rise. The systolic blood pressure had a slight downward trend as shown in Fig. 2. Eight days after admission the blood uric acid had risen from 4.7 to 6.17 mgm. % and it was decided to terminate the pregnancy by Cæsarean section. The indications for this course were: (1) a large fibromyoma of the uterus which was palpable abdominally; (2) the age of the patient.

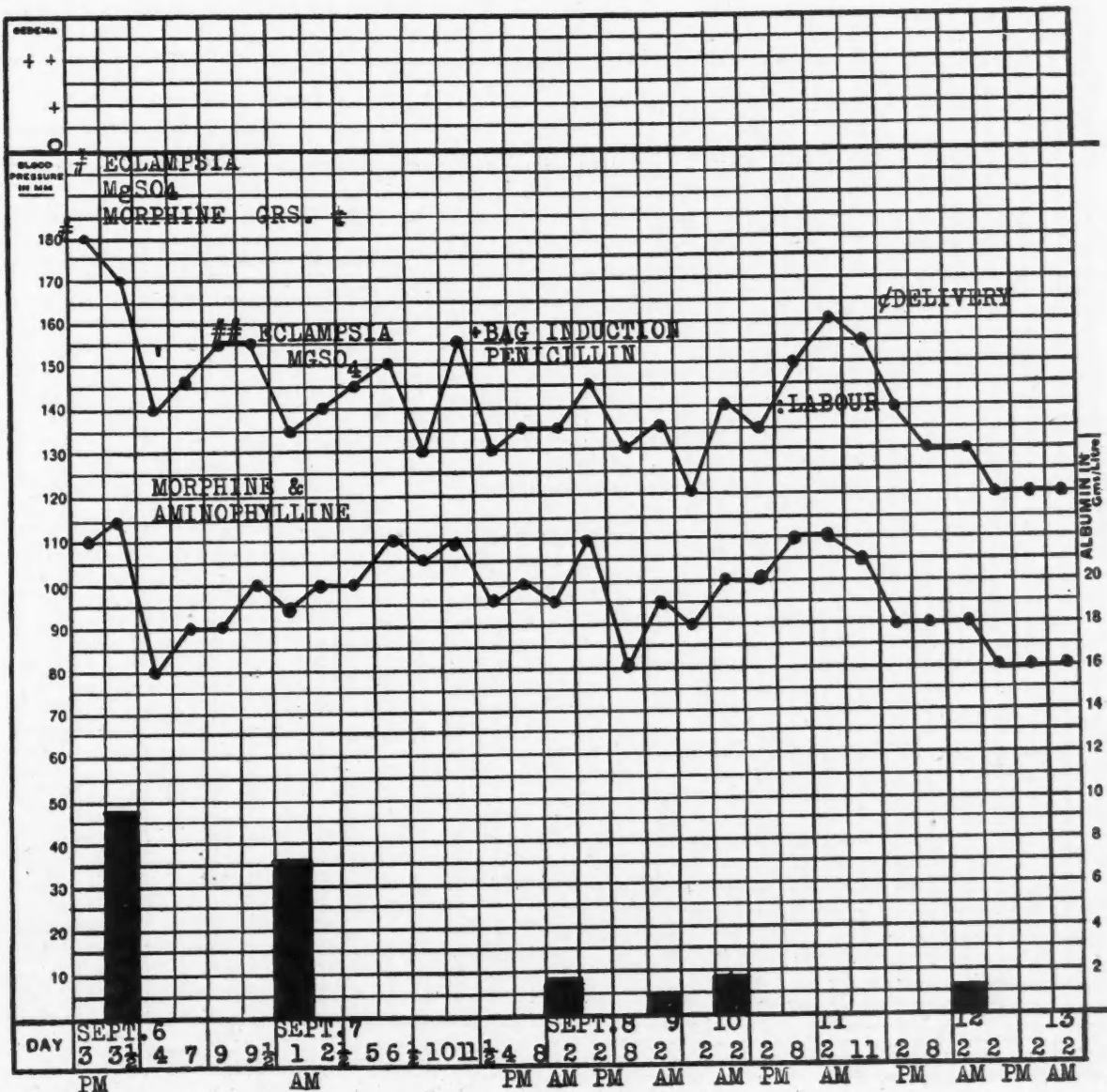


Fig. 3. (Case 3).—Eclampsia.

The Cæsarean was done under local anæsthesia. A living male child was delivered and supravaginal hysterectomy performed. At operation the uterus was found to be drawn and turned to the right so that the left tube and ovary were lying anteriorly and in the line of incision. There were several subserous fibroid nodules in the fundus including one on the right side the size of a large orange which was calcified. The postoperative course was normal and uneventful. On discharge the blood uric acid was 4.67 mgm. % non-protein nitrogen 26.6 mgm. %, carbon dioxide containing capacity 55.7 vols. %, total protein 5.95 gm. %. At the first postpartum visit the blood pressure was 108/70 and the urine showed a very faint trace of albumin.

CASE 3

The third patient (Fig. 3), Mrs. S.M., a para 0, aged 31, was admitted in eclampsia six months' pregnant with no history of prenatal care. She had had four eclamptic seizures prior to admission. Morphine, gr. $\frac{1}{4}$, and 10 c.c. of a 25% solution of magnesium sulphate were administered immediately. Blood pressure on admission was 180/110. There was no œdema. The urine boiled solid on testing for albumin. There were $9\frac{1}{2}$ gm. per litre in the admission specimen. There were

many granular casts and some white blood cells and red blood cells in the catheter specimen. The sedation produced a drop of blood pressure, but another convulsion followed in six hours. Morphine and magnesium sulphate were given as indicated in Fig. 3. Hemoglobin was 82%, blood group A B, Rh positive. Blood uric acid was 9.74 mgm. %, creatinin 1.8 mgm. % non-protein nitrogen 35.6 mgm. %, cholesterol 188 mgm. %.

Eighteen hours after admission the general condition of the patient was somewhat improved. Fluid intake was maintained at 3,000 c.c. per 24 hours by intravenous therapy. No further convulsions took place, but the level of the blood pressure was maintained at 155/110 mm. Hg. and the urinary output was 2,000 c.c. Termination of pregnancy was deemed advisable. The patient was examined and the cervix found to be closed, long and thick. Dilatation was successful only to a No. 7 Hegar. In order to insert a bag and rupture the membranes, the cervix was split posteriorly. Labour began seventy-two hours later. The first and second stage of labour lasted twenty-four hours and a macerated dead born fetus was delivered spontaneously LOA. The postpartum course was uneventful and non-morbid. The blood chemistry seven days postpartum showed a blood uric acid of 2.42 mgm. %, creatinin 0.76, non-protein

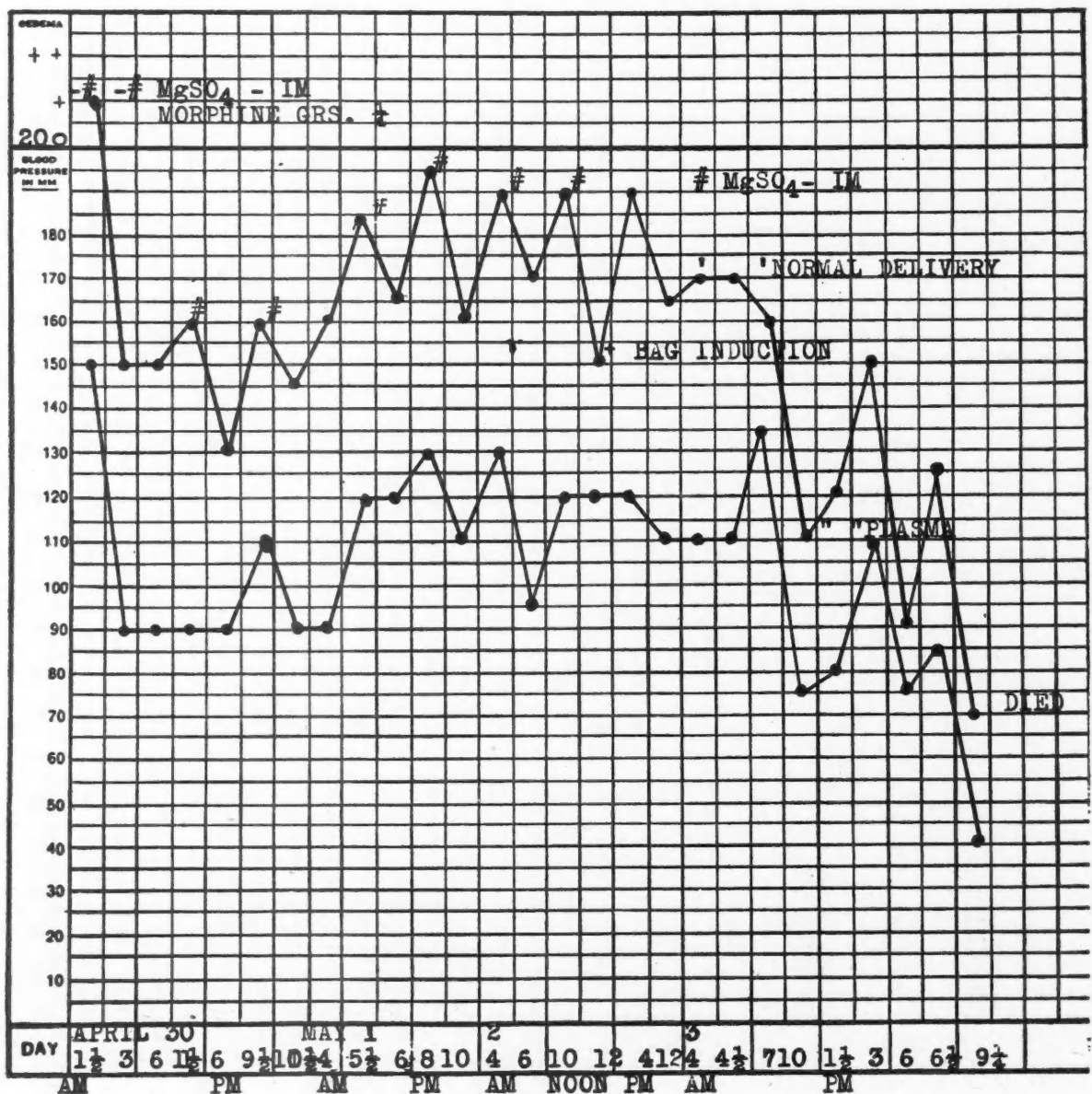


Fig. 4. (Case 4).—Eclampsia.

nitrogen 20.4, total protein 7.36 gm. %. Blood pressure on discharge was 110/70, urine was normal and the eyegrounds were normal. At the six weeks postpartum visit blood pressure was 118/80, urine normal. There were no signs of residual cardiovascular or renal disease.

CASE 4

The fourth patient (Fig. 4), a para 0, aged 20, was admitted eight months' pregnant with a history of one convulsion prior to admission and no prenatal care. There had been complaints of disturbances of vision for four months, oedema of the face and extremities for two months and headache for one week. There was no familial or personal history of importance. The blood pressure on admission was 210/150. The urine boiled solid on testing for albumin and showed many granular casts, red blood cells and white blood cells in the catheter specimen. There was generalized oedema. Morphine gr. $\frac{1}{4}$ and 10 c.c. of a 25% solution of magnesium sulphate were administered intramuscularly on admission and magnesium sulphate repeated as indicated in the chart. Investigation showed a blood uric acid of 7.27 mgm. %, non-protein nitrogen 38.0 mgm. %, cholesterol 380 mgm. %, total protein 4.97 mgm. %. Dietary deficiency in this case contributed in large measure to the low total protein. Hæmoglobin was 72%. Intake was maintained at 2,500 c.c. per day and consisted of intravenous glucose in water.

After forty-eight hours of careful observation there was no improvement in the patient's general condition and the blood pressure remained in the vicinity of 190/120 mm. Hg. Urinary output was down to 700 c.c. per twenty-four hours. Bag induction was performed. Labour lasted fifteen hours and a living male child delivered spontaneously as an LOA. The infant died twenty-nine hours later of intracranial hæmorrhage. The maternal course after delivery was characterized by episodes of shock which responded poorly to all supportive measures, including plasma transfusion, nasal oxygen and cardiac and respiratory stimulants. The patient died seventeen hours after delivery. Terminal blood uric acid was 7.84 mgm. %, creatinin 2.76 mgm. %, non-protein nitrogen 58.2 mgm. %.

Necropsy findings revealed liver necrosis and eclamptic glomerulosclerosis. The liver damage was so severe that the necrosis did not show its typical periportal distribution, but was almost a uniform non-hæmorrhagic necrosis of the entire liver substance. There were also numerous subcapsular hæmorrhages in the superior surface of the liver. The kidneys were swollen and pale and showed a bloodless condition of the glomeruli due to thickening of their basement membranes and to swelling of their endothelial cells, i.e., changes described as eclamptic glomerulosclerosis. The renal tubules also showed some epithelial degeneration and swelling. Fat stains did not show the presence of any fat in the cells. There was massive hyperæmia and oedema of both lungs with some atelectasis of both lower lobes. These pulmonary changes were probably the immediate cause of death and were, no doubt, occasioned by a circulatory failure as indicated by the clinical tachycardia and falling blood pressure. The heart, however, showed no morphological evidence of functional myocardial impairment except for some fragmentation. The uterus was in the postpartum state and showed two small cervical tears. The breasts were lactating and the pituitary gland was slightly enlarged and contained many pregnancy cells. The brain failed to show any significant changes.

SUMMARY

1. The classification of the toxæmias recognized by the American Committee on Maternal Welfare has been presented.

2. The etiology of oedema in pregnancy has been reviewed. The production of oedema in

pregnancy is a result of retention of the sodium ion.

3. Important considerations of the treatment of the toxæmias has been discussed and four cases presented.

4. Eclampsia is a serious disease, both for mother and fetus. Good prognostic signs are a diuresis and a drop in blood pressure that is maintained at or slightly above normal levels. The prognosis is poor if there is a progressive unexplained drop in blood pressure.

I am greatly indebted to Professor H. Hoff, and Dr. N. W. Philpott, for their advice in the preparation of this paper.

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A ROUND TABLE DISCUSSION ON SINUSITIS*

The following took part:

Dr. Fred Smith, *Bacteriologist*;
Dr. George Hilton, *Otolaryngologist*;
Dr. A. T. Henderson, *Allergist*;
Dr. Jules Brahy, *Otolaryngologist*;
Dr. Hervé LaCharité, *Radiologist*

DR. G. EDWARD TREMBLE, Chairman:

Sinusitis is a term frequently confused by the layman and the family physician in describing headaches of unknown origin. Every day patients consult nose and throat specialists regarding headaches which they attribute to sinusitis but on careful examination, the sinuses are proved innocent.

Practically every case of sinusitis develops from a cold in the head but at times the patient is unaware of the initial rhinitis. In the early stages of an acute head cold, the nasal mucous membrane becomes hyperæmic and engorged. A watery serum passes through the dilated capillary walls but within a day or two, this discharge becomes thicker as fibrin, leucocytes and plasma cells are added to the exudate. As the mucous membrane of the nose is continuous and lines the sinuses as well, it follows that every acute rhinitis is potentially an acute sinusitis. Frequently instead of the inflammation from a head cold quieting down, the discharge continues and becomes purulent, the nose blocks intermittently and periodic headache is often present. When this occurs in all probability one or more of the sinuses is infected and secondary invaders are responsible for the purulent material.

DR. JULES BRAHY referred briefly to the *anatomy of the sinuses*:

He showed that the nasal fossa, the sinuses, the meati are covered with or lined by a mucous membrane, the epithelium of which is ciliated. Therefore the nasal ciliated epithelium constitutes in the normal nose a continuous covering which lines the nasal chambers, the ostia and the sinuses in one unbroken sheet. (It is wanting in only two locations, the olfactory area and the pre-turbinal area.) Ciliary streaming is invariably toward the pharynx. The overlying blanket of mucus

always moves from the more remote area of the sinuses toward and through the ostia, thence backward through the meatuses to the epipharynx.

The journey from the remotest corner of the farthest sinus to the pharynx consumes about twenty minutes. From the standpoint of protection, the time element is of importance, since more pathogenic bacteria are thus disposed of before they can injure the host. The forward and backward movement of the cilia have been designated the "effective" stroke and the "recovery" stroke, (wave motion).

DR. LACHARITÉ spoke at some length on *treatment in sinusitis*:

Butler and Woolley in 1934 established the rationale of the effect of x-ray on infected sinuses. They showed that the "beneficial effects of x-radiation are due to the radiosensitivity of lymphoid structures of the hypertrophied membrane and the lymphocytes which, under small doses, are broken down thus liberating bacteriolysins which activate the macrophages to greater bactericidal activity. At the same time the oedema of the ostia is reduced, opening them up and allowing freer drainage and aeration. Following x-ray treatment, destruction of the lymphocytes can be demonstrated on the second or third day. The macrophages can later be found loaded with debris and engulfed bacteria. The oedematous membrane gradually decreases in thickness and after one week fibrosis begins to appear. After several weeks the lymphocytes reappear. The fibrosis seems to be the result of the inflammatory process rather than the x-ray treatment, since there is no injury to the cilia, epithelium or cellular elements.

The common cold that does not clear up after a reasonable time is usually an infection of the sinuses. In the average acute or semi-acute infection the routine treatment with astringents, packing, suction, washing and the like has been followed by a clearing up of the condition. In some, however, in spite of the treatment, definite changes have occurred in the sinuses, especially the formation of thick membranes and granulations. This group has responded more favourably to roentgen therapy than any of the other types. The second largest group in which roentgen therapy has

* The Seventy-sixth Annual Meeting of the Canadian Medical Association, Montreal, June 14, 1945.

been effective is one in which a cough or recurrent colds have appeared for months or years. The roentgenograms show cloudy ethmoids with marked thickening of the mucoperiosteum and some air space. Washing causes little or no change in the appearance of the antrums. Many of these will show an increase in the bronchovascular shadows at the bases of the lungs, some definite infiltration and, in the more chronic ones, early bronchiectasis. In this group of cases Osmond, Manges and Rathbone have reported excellent results from roentgen therapy. In acute infections with pus in the sinuses and with dense antrums, but especially in those without too long a history of trouble, the results from roentgen therapy have been so encouraging that it should always be tried since in so many of these the rhinologist must resort to radical surgical intervention for much benefit.

The closest co-operation must exist between the otolaryngologist and the radiologist in the treatment of sinusitis. The x-ray should be administered after shrinkage of the swollen nasal mucosa by astringent packs, suction, and the like. Where the treatment is adapted to the patient, better results will be obtained. Other physical agents, such as radiant heat, infra-red, ultraviolet, classic and short wave diathermy, may be used to advantage in combination with x-ray therapy in some patients.

In 1939, Hodges and Snead worked on the classification of sinus infections as to radiosensitivity. Recent work has emphasized the value of this classification.

The most striking effect of roentgen therapy of acute sinusitis is the relief of pain and headache. Such relief is noted early in cases in which there are favourable results from this type of therapy. This relief of pain is often accompanied by a noticeable increase in the discharge, so that the effect of roentgentherapy on the sinuses may be due to diminishing the engorgement of the nasal mucosa. This effect is definitely observable. If no other effects were obtained, symptomatic relief is great enough to justify the use of this therapeutic method. More good results seemed to be obtainable when therapy was instituted early, and the results seemed to be better in an initial attack of sinusitis than in a recurrence after one or more previous attacks.

To summarize: The best results have been found in sub-acute and sub-chronic infections. The chronic infection associated with hypertrophic membrane responds best. Polyps and cysts were benefited but little, except where the treatment was used after operation. In these cases there were fewer recurrences. I want to emphasize that wholehearted and sincere co-operation between the rhinologist, radiologist and the allergist is absolutely essential if the best results are to be obtained.

METHOD OF TREATMENT AND TECHNIQUE

Only those sinuses giving symptoms and showing objective evidence of involvement should be treated. If the patient is diagnosed as having pansinusitis, all the sinuses should be treated. Otherwise only the sinus or sinuses involved are treated. The doses used in each case should be in accordance with the duration and severity of the infection. As a rule small doses should be given in acute cases when the chronic cases require larger doses with a few days' interval.

DR. GEORGE HILTON spoke on *treatment in sinusitis*:

These patients with acute sinusitis are sick and very unhappy and the first part of your treatment is confining him to bed, if he has not already gone there of his own free will. Measures must now be adopted to relieve the condition and make the patient comfortable. Of paramount importance is the establishment of free drainage from the sinuses. Like an abscess in the body, drainage must be established as soon as possible.

The pain in these conditions is variable but may be so severe as to drive the patient to distraction. A hypo of morphine may be the only treatment that gives relief from the pain and may have to be repeated. Where less severe pain is experienced, usually aspirin compound with codein is sufficient.

A good astringent for the nasal mucous membrane is essential. There are many good astringent nose drops and sprays on the market today but not every patient reacts the same to any given drops or spray. I have tried most of them but find a 1% ephedrine in normal saline suits the majority of patients and gives good results. Whether you prescribe drops or spray, it is of utmost importance that you give your patient implicit directions as to their use. Ordi-

narily if you tell a patient to use nose drops he will stand in front of a mirror, tip his head back and put the drops in. The result is the drops run down the floor of the nose and into the throat and fail to reach the all-important middle turbinate area. If drops are to be used, instruct your patient to lie flat on his back across the bed with his head hanging over the side so his chin is pointing to the ceiling. He should get as far back as possible. Eight to ten drops of the 1% ephedrine solution should now be instilled in each nostril and the patient should remain in this position for a minute. This procedure should be repeated every two hours for the first twenty-four to forty-eight hours until definite improvement shows and then the number of times the drops are to be used may be decreased. If at your previous examination of the nose you found the airway almost or completely blocked by engorgement of the inferior turbinate, I think it advisable to have the patient for the first time or two use his drops and repeat them again in twenty minutes. The reason for this is that if the nose is blocked by the inferior turbinate, the drops when first introduced probably don't get beyond this area. However, once the inferior turbinate shrinks down, the second application of drops in twenty minutes will reach the vital area of the middle turbinate. The same plan applies to the use of the solution as a spray. The nozzle of the spray should be tightly applied to the nostril to be sprayed and the opposite nostril closed. The spray should be directed towards the angle of the eye and the patient instructed to inhale on that side as the bulb of the spray is compressed. Seven or eight squirts are given and as in the use of drops, it should be repeated in twenty minutes for the first time or two if the nose has been completely blocked.

Heat to the face and sinuses gives a great deal of relief to the patient and helps resorb the inflammatory products. The heat should be applied for half an hour three to four times daily and preferably about twenty minutes after the patient has used his spray or drops. Reflected, dry heat seems the best and most easily used by means of the electric light head baker as used in our hospitals. An ordinary electric heater may be used or failing this an open-faced toaster brought close to the face works well. A female patient should be advised to fasten her hair up, so that it doesn't become ignited in the element of the heater which happened to

one of my patients. Electric heating pads and hot compresses help when nothing else is available. Even bringing the face up close to the old country stove is better than nothing.

Steam inhalations every three to four hours for twenty minutes to begin with are helpful. They help to liquefy the nasal secretions and soothe the inflamed mucous membranes. Instruct your patient how to use steam or you will find him inhaling from a tea-cup when you next visit him. I think the easiest and simplest way to take steam inhalations is as follows: Put an empty pillow case on the floor next to the patient's bed. Put a pail inside the pillow case and pour a full kettle of boiling water into the pail. Have the patient lean over the edge of the bed and fold the open part of the pillow case around his nose and mouth and breathe the steam in for fifteen to twenty minutes. This method avoids the patient getting his hair damp or wet and the possibility of contracting a fresh cold.

I think the sulfa drugs should be used in these acute sinus infections. They not only help to clear up the sinus infection but also help to prevent complications. Penicillin is being used now in these acute sinus infections with good results.

It is very rarely that an acute sinusitis does not respond to the above treatment but if no improvement is evident within twenty-four to forty-eight hours, it may be necessary to institute certain minor surgical procedures to improve drainage.

When drainage is well established, it is most important that the patient be kept under close observation and treatment until cured as inadequately treated cases of acute sinusitis often go on to the chronic stage. Even with proper treatment, the sinus condition may be slow in healing or incompletely healed, so that treatment is prolonged. It is here that the Proetz method of sinus displacement works so well. By this means the air in the sinuses is replaced by any fluid one wishes to employ. Thus 1/2% ephedrine in saline or with sulfathiazole or penicillin may be introduced into the sinuses.

The non-surgical treatment of chronic sinusitis is very limited as most of these cases require some type of minor or major surgical intervention in the nose or sinuses. In chronic sinusitis conservative treatment works better in children than in adults. A long standing chronic sinu-

itis in a child will often clear up spectacularly when diseased tonsils and adenoid are removed. Sinus displacement works well in children and they react well to proper treatment.

DR. A. T. HENDERSON discussed some of the *allergic aspects* of sinus infection:

Geo. E. Shambaugh, Jr., in speaking of the unsatisfactory results in chronic nasal and sinus infections in spite of prolonged local treatment and repeated surgery, says:

"We are finding that an underlying allergy is perhaps the most important of the etiological factors."

As the basis for subsequent infection, we think that upper respiratory allergy must assume great importance.

Seasonal hay fever must be mentioned first. Some of the seasonal cases are due to mould spores.

Vasomotor rhinitis—hyperæsthetic or allergic rhinitis—occurs all through the year. This may be found in association with definite pollen sensitivity when some seasonal exacerbation is exhibited. But in these perennial cases, other inhalants may be responsible. These comprise a wide variety of substances, among the most important being feather pillows, mattress and upholstery stuffing such as horse and rabbit hair, kapoc, etc. Dogs, cats, canaries and other birds are also potent sources of inhalant allergy, in addition to orris root in cosmetics, pyrethrum in insecticides and mould spores found especially in damp houses or old bedding. Probably most important of all is common house dust. Feathers may be covered with protective material but house dust means special precautions such as the avoidance of heavy drapes and rugs, avoidance of dry sweeping with regular vacuuming of the mattress, etc. Hyposensitization is carried out by injections with a stock or autogenous extract; the latter is preferable. The house dust factor is of course chiefly operative in the winter months. House-wives may get allergic rhinitis from the inhalation of wheat and other grain flour, while linseed or karaya gum in hair-setting applications may be the cause, as may the inhalation of certain drugs particularly by pharmacists.

Foods undoubtedly may cause this condition. Skin tests may ascertain the offender, but resort may need be made to elimination diets of one kind or another, as clinical sensitivity may exist in the presence of negative food tests.

Dilatation of capillaries, a fundamental reaction in allergy with resultant œdema, leads in hay fever and allergic rhinitis to marked swelling of the mucous membrane, producing blocked nostrils but also involving the sinus mucosa. The ostia from the sinus become occluded, the air becomes absorbed within the sinus, drainage is interfered with, and stagnant secretions if the process continues especially after the summer weather, readily become infected and sinusitis results.

So as a starting point in the non-surgical treatment of sinus infections, I would urge adequate treatment of hay fever patients, also of the vasomotor rhinitis case.

In a small percentage of the sinus cases the infection may be primary and the allergic rhinitis due to it as the result of a bacterial allergy, but usually the sinus infection is secondary to the disturbed state of the nasal mucosa. In some cases a vicious circle would appear to be established.

A word of warning may be permitted: Do not operate on potential allergies during the pollen season; and this applies also to tonsillectomies. Also, cases should not be subjected to surgery before due consideration has been given to a possible allergic etiology.

Too often allergy and infection are inextricably combined. The history helps. It should be detailed as regards season and mode of onset, locality, chronicity and remissions. We have seen many returned men who had no trouble overseas, on coming home begin to manifest symptoms of nasal allergy during the ragweed season. The influence of environment, weather, exercise, open air, fatigue factors and possible hypothyroidism should also be taken into account.

Examination of the nose usually reveals a characteristic mucosa. It is pale, boggy, œdematous and bluish, generally shrinks poorly with cocaine. These people are often prurine addicts and their condition is by this means perpetuated. Examination of the nasal secretions in the allergic shows a preponderance of eosinophiles. Polypoidal changes in the nose and sinuses are commonly observed. X-ray tends to show bilateral involvement. A hæmogram aids us in estimating the relative influence of allergy and infection.

We believe that the patient with mucous nasal polypi must be regarded as allergic until

proved otherwise. Histological study of these polyps reveals marked edema and eosinophilic infiltration. It is only fair to state that not everyone subscribes to this view. Egston in New York thought that they were best explained by a strangulation process analogous to hæmorrhoids.

DR. FRED SMITH:

While it is true most infections labelled sinusitis are due to various Gram-positive cocci, it is worth remembering that some of them are due to the influenza bacillus, colon bacillus, etc. If you are thinking of waiting those out you will probably find they tend not to disappear, but to become chronic. Incidentally, these are the very ones which respond poorly to chemotherapy and vaccines.

From the chemotherapeutic point of view, I think it is worth while to know the type of microbe involved. If the staphylococcus is the cause it will require much longer treatment with penicillin than if the pneumococcus was the cause. If you have a colon bacillus it is a waste of time to try sulfonamides or penicillin. The new material, streptomycin, may prove valuable against these Gram-negative bacilli.

As for the value of vaccines, certain species infecting micro-organisms, such as the pneumococcus and streptococcus, usually respond well. On the other hand, vaccines alone in sinus infections with staphylococcus, *H. influenzae* or *B. coli* usually effect little improvement. There are two kinds of vaccines—stock and autogenous. It is much more convenient to be able to buy a bottle of vaccine rather than to go to the trouble of making an autogenous one. There are 33 types of pneumococcus recognized and 70 known. Similarly there are many serological types of streptococcus, influenza bacillus, and so on. Now commercial makers of vaccines put 4 or 5 strains of organisms in their bottles. It is pretty clear that identity between one of these and the patient's infecting organism is mathematically improbable. That is, I think, one value in making cultures and autogenous vaccines.

Then there is the matter of how you are going to introduce the vaccines into the patient. It is a reasonable assumption that if vaccines will not immunize by injection, they will fail to do so when taken by mouth. Moreover, the patient is frequently swallowing copious amounts of what is undoubtedly the correct

type of organism—his own. Yet the use of oral vaccines is widely practiced. It is questionable whether they are of any use at all.

Amongst the questions asked were the following:

What is the relation of pulmonary infection to sinusitis?

Sinusitis may be the result of a lower respiratory infection such as bronchiectasis, the infection being transferred upward by cough.

How important is environment to patients suffering from sinusitis?

Environment in sinusitis plays quite an important part. Many of these sinus patients are living in unsuitable quarters, such as overheated houses where the humidity is decreased. Then again the climate may be such that it dries out the nasal mucosa. Many of these chronic sinus infections cannot live in a climate where there are extreme changes of temperature and humidity. Sometimes certain sinusitis patients are better in damp wet weather and this type of patient is better in a humid atmosphere, while others will tell you that all their neuralgic pains are increasing if they experience damp days. This type of patient does well in a more temperate climate where there are not great changes of temperature.

What is the value of Dowling's argyrol packs in treatment?

Silver salt preparations in the proper strength do not appear to injure the cilia of the nose but due to the clumping effect on the cilia the normal streaming of mucus toward the nasopharynx is hindered.

Is there any objection to the Parkinson position for the instillation of nose drops?

I always ask patients to lie back with the head well extended over the edge of the bed. Lying flat the patient is then instructed to roll slightly to the right turning the head over to the right. Drops instilled into the lower right nostril run over the lateral wall of the nose where the sinus ostia are situated. This is in reality a modified Parkinson position.

How does x-ray treatment help in the removal of polyps?

A case of polyps could be treated with x-ray when they are very small but when they are large, they should be removed and patient treated with x-ray to prevent recurrence.

What about hepamine?

Dr. Henderson said: We tried this preparation—it is histamine combined with horse serum globulin—on some selected cases of allergic rhinitis with disappointing results. Occasionally it seemed to help. Ordinary histamine phosphate will do just as well and may be used instead, according to the technique recommended by Farmer.

How long is x-ray treatment to be carried on?

As long as there is some thickening of the mucosa. There should be four concentrated doses and then a rest period of ten days.

What relation have tonsils and adenoid to sinusitis in children?

This is a very good question as the symptoms are often the same. Repeated colds, nasal obstruction and cough are the most frequent complaints and often the tonsils are removed in these cases, when the underlying cause is an infected sinus. However, after a careful examination is carried out including the nasopharyngoscope and x-rays and nothing is found to suggest sinusitis, we think it is justifiable to remove the tonsils and adenoid as the majority of cases are greatly improved, even if the sinuses are mildly involved. By removing the focus and obstruction, ventilation and drainage are established which help clear up the symptoms.

CHORIONEPITHELIOMA

By W. Pelton Tew, M.B.,
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London, Ont.

THE fact that three cases of chorionepithelioma have occurred in our department within a period of one year seems of sufficient significance to merit reporting. In the previous ten years we had but one case of chorionepithelioma. It is now six years since these three cases occurred and we have, therefore, had a reasonable time to follow up the results. A fourth case has occurred since then and will be included, making four cases in all.

HISTORICAL REVIEW

Sanger described the first authentic case of chorionepithelioma in 1892 occurring in a woman

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23 years old. She aborted in the eighth week of pregnancy and died seven months later. In 1895 the late Professor Whitridge Williams published a monograph on the subject of chorionepithelioma in which he reported one case of his own, along with 24 others collected from the literature. The case reported by Professor Williams was that of a coloured woman who developed a nodule on the right labia majora one week after a spontaneous full-term labour. This patient developed a cough with a blood-stained sputum, and died six months after delivery. At the same time in 1895, Marchand wrote a monograph on the same disease. He identified the masses of syncytium in the growth. Three years later the subject was again reviewed, when both layers of the chorionic epithelium were described as being of fetal origin, instead of Langhans' only, as was originally conceded. Marchand now gave the tumour the name chorionepithelioma which it still bears.

PATHOLOGY

Chorionepithelioma may occur in a typical or an atypical form. The typical form presents cells which have an appearance identical with that presented by the chorionic epithelium in early pregnancy. In the atypical form the cells merely infiltrate the uterine wall without giving rise to a true tumour formation. Both varieties seem to be equally malignant. In a few rare instances the primary growth may originate outside of the uterus. Several such cases have originated in the Fallopian tube. Chorionepithelioma metastasizes rapidly, particularly to the lungs, vagina, and brain. The metastases occur chiefly through the blood channels, because of the tendency of the fetal ectodermal cells to erode and invade the blood vessels. Metastases are said to occur in the lungs in about 75%, in the vagina 54%, and in the brain in 5% in a series of 52 cases reported by Dorland.

The syncytium appears as large multi-nucleated, irregular masses of protoplasm, in which no definite cell boundaries are recognized. These cells are riddled with vacuoles. The nuclei are small, oval, dense and deeply stained. Langhans' layer appears in the form of small, well defined polyhedral cells with large vesicular nuclei packed together in masses without any connective tissue stroma between them. These two tissue elements are present in varying proportions in different tumours.

The tumour usually occurs primarily in the wall of the uterus. It may appear as an interstitial growth in the uterine wall. The uterus is usually enlarged considerably and softened. Rounded elevations may appear on the surface of the uterus. Ulceration may occur on the tumours which project into the uterine cavity. On gross section the tumour appears as a rounded semi-solid mass composed of firm red blood clot mixed with pale areas, which consist of fibrin, tumour tissue, or uterine tissue in a degenerated state. It has the gross appearance of a fleshy mole. The secondary growths have a similar appearance to the primary tumours.

CLINICAL FEATURES

Chorionepithelioma may occur at any age during the child-bearing period. It commonly follows a pregnancy whether it is in the uterus, tube or ovary. The pregnancy may terminate in a full term labour, abortion or hydatidiform mole. Hydatidiform mole is associated with the growth in about 50% of the cases. On the other hand only about 5% of the hydatidiform moles become chorionepitheliomas. The commonest early symptom is abnormal vaginal bleeding. Occasionally there are painful uterine contractions, and a few patients have nausea and vomiting. In the very early stages there are probably no symptoms whatsoever.

Diagnosis.—This is of vital importance because early active treatment is the only treatment of any value. The final diagnosis is made upon these three points: (a) the history; (b) the findings from a diagnostic curettage; (c) the results of the Aschheim-Zondek or Friedman test. These tests will be strongly positive even in well diluted specimens.

TREATMENT

The choice of treatment is a radical pan-hysterectomy for all cases where this is possible. This is followed by a suitable course of deep x-ray therapy. The only other treatment we have to offer the patient where such an operation is not possible is of course radium and deep x-ray. In our experience, treatment with radium and deep x-ray has been most unsatisfactory. This, no doubt, is due to the fact that we have used radiation treatment in the more advanced cases which have not been suitable for surgery.

CASE 1

Mrs. E.N., aged 30, para 2, height 5' 3", weight 109½ lb. On August 4, 1936, Mrs. E.N. reported to me for the first time, stating that she was having some

vaginal flowing. Her last normal menstrual period was May 3, 1936. Her past history seemed normal, and she had had one normal child about three years ago. She was sent to bed and given a sedative along with wheat germ oil, three drams daily.

August 15.—The patient was sent to the hospital because of an incomplete abortion, and the abortion was completed under general anaesthesia.

Laboratory findings: hæmoglobin 60%; red cell count 3,170,000; white cell count 12,350. The urine showed albumin +.

The pathological report showed: necrotic placenta with hydatidiform deterioration.

August 23.—Convalescence after the abortion was relatively normal; there was very little if any flowing on this date, and the patient was allowed to go home.

September 1.—There was no flowing, but there was a small amount of yellowish vaginal discharge. The patient was now receiving iron for her second degree anaemia.

October 5.—Some vaginal bleeding, which was considered to be a menstrual period. This bleeding lasted for over a week, and then subsided.

October 28.—The patient reported to the office, stating that she had menstruated at least three times in the past month. Pelvic examination revealed that there was no vaginal flowing on this date. The uterus was in a second degree retroversion, and there was an ovarian cyst on the left side, about the size of a lemon.

November 1.—Dilatation and curettage, with removal of ovarian cyst, and appendectomy. The curettings on this occasion were very scant, and not at all suggestive, at least grossly, of any malignant change. There was one small piece, about the size of a pea, which did resemble necrotic decidua. Convalescence following this operation was normal.

The pathological report showed: chorionepithelioma of the uterus; follicular cyst of the ovary; simple unilocular cyst (perhaps a theca-lutein cyst); chronic appendicitis.

November 6.—Estroform 2,000 international units was given intramuscularly. This was repeated daily for five consecutive days in an attempt to combat the invasion of the new growth.

November 7.—A.Z. test was weakly positive.

November 20.—X-ray examination of the chest did not reveal any sign of metastatic growths.

November 21.—A.Z. test was negative.

November 22.—The patient's general condition was now considered satisfactory enough to proceed with the next operation.

November 23.—Pan-hysterectomy. After the operation, the patient was given 420 c.c. of whole blood intravenously. Her convalescence following this operation was highly satisfactory.

December 21.—A.Z. test was negative. Patient discharged from the hospital with the abdominal wound well healed, and her general condition satisfactory.

FOLLOW-UP NOTES

January 14.—A.Z. test was negative. The abdominal wound is well healed. The patient feels well, and appears to be improving, weight 117½ lb., hæmoglobin, 98%, pelvis seems normal, the patient looks well.

March 11.—Weight 122½ lb., hæmoglobin 100%, the pelvis seems normal, A.Z. test negative.

April 8.—Weight 122 lb., hæmoglobin 98%, general condition very satisfactory.

May 21.—Weight 124½ lb., hæmoglobin 98%, pelvis normal.

June 17.—Weight 126 lb., hæmoglobin 100%, general condition very satisfactory.

September 8.—Weight 130¼ lb., hæmoglobin 98%, general condition satisfactory.

November 8.—A.Z. test negative, weight 127½ lb., hæmoglobin 98%, general condition is very satisfactory.

February 7.—Weight 116½ lb., pelvis seems normal. Unable to account for the loss of weight, but there does not seem to be any clinical evidence of extension of the new growth.

March 16.—Weight 114½ lb., hæmoglobin 95%, general condition quite satisfactory.

I have seen this patient periodically since 1938 and there has been no recurrence of the malignant disease. She is in excellent health up to date.

CASE 2

Mrs. D.B., was a white married woman, aged 22, para 2. She had one full term living baby in May, 1936. At that time she had definite symptoms of pre-eclampsia just before full term. Her past history seems relatively normal otherwise. Menstruation reappeared one month after the birth of her first baby and remained regular until recently. Her last normal menstrual period was February 28, 1937.

History of present illness.—This patient was admitted to Victoria Hospital, London, at midnight March 29, 1937. This was ten months after the birth of her first baby. Her menstrual periods were normal up to her last period two and a half weeks before admission to hospital. During these two and a half weeks she had fairly constant vaginal bleeding. Three hours before coming to hospital she had a profuse hæmorrhage. She said she had morning sickness for five weeks previously, and for three weeks had noticed considerable swelling of her lower limbs and hands.

Findings on admission.—Patient was a well developed white woman and appeared very pale. There was considerable swelling of the extremities and also some swelling of the face and body. The fundus of the uterus was two inches below the umbilicus and there was distinct tenderness over what appeared to be the whole uterus.

There was considerable blood clot in the vagina. The cervix admitted one finger easily and was very soft. The uterus was enlarged to the size of a 4½ months' pregnancy. The vagina was packed firmly with gauze at 12.30 midnight. Morphine gr. ¼ was given hypodermically at that time. The blood pressure was 118/40. The temperature was 99 and the pulse rate 140. Urinalysis on admission was acid, cloudy, amber coloured, albumin 4+, sugar, slight trace, numerous casts, and pus 8 cells to the high power field.

The provisional diagnosis was (a) accidental hæmorrhage; (b) acute nephritis.

March 29.—Patient seen in consultation with Professor George C. Hale, and his report was as follows: "Question of nephrosis or nephritis (more laboratory evidence required). We think a 250 c.c. transfusion would be best now, followed by emptying of uterus. The next 250 c.c. of blood could be given after operation (if no reaction follows the first one)."

The vaginal packing was removed and the uterus evacuated of its contents with the patient under general anæsthetic. The emptying was done with a gloved finger and with a large, dull curette. A mass of white, grape-like structure was removed and the uterine cavity was again packed with plain gauze, after making reasonably sure that the cavity was empty. A blood transfusion of 500 c.c. of whole blood was given at this time.

March 30.—The pathological report showed decidua and portions of hydatidiform mole showing a malignant transformation into chorionepithelioma.

March 31.

MOSENTHAL TEST

	Time	
	Total day specimen 7 a.m.-7 p.m.	Total night specimen 7 p.m.-7 a.m.
Volume.....	1,645 c.c.	340 c.c.
Specific gravity.....	1.015	1.021
Albumen.....		+
Blood.....		150 h.p.f.
Pus.....		100 h.p.f.

Plasma proteins.—Total proteins 5.4%, fibrinogen 0.5%, albumin 2.1%, globulin 2.8%, albumin-globulin ratio 0.8%.

April 4.—250 c.c. of blood given by indirect method.
April 5.—Blood cholesterol estimation, 200 mgm. % in whole blood.

April 8.—300 c.c. of blood given by indirect method.
April 10.—Pan-hysterectomy was carried out.

Pathological report: chorionepithelioma of uterus; multiple follicular cysts of both ovaries.

Blood pressure.—March 30, 140/40; March 31, 150/76; April 4, 146/66; April 8, 120/56.

April 3.—Hæmoglobin 55%, erythrocytes 2,110,000, colour index 1.17, leucocytes 12,750, neutrophils 60, mature forms 56, young forms 4, lymphocytes 38, eosinophiles 1, monocytes 1. Appearance of red cells, frequent ring forms, marked anisocytosis.

There was a moderate degree of fever for about a week after operation, after which the general condition of the patient was very satisfactory.

This patient was seen periodically since the time of her operation. I last saw her in April, 1944, when her condition was excellent with no signs of spread of the tumour. She seems now to be in perfect health seven years after her operation.

CASE 3

Mrs. S.B., 32 years old, admitted to Victoria Hospital April 15, 1937, in labour. This was a full term labour and seemed normal. She was discharged from the hospital on the 12th day after delivery. At this time the lochia was scant and normal. Admitted again May 12. The patient was admitted to the gynæcological ward complaining of vaginal bleeding. She had been home since April 27, following her confinement. Since going home she says she has been bleeding a little more each day. On admission to the hospital the pulse rate was 90 and the temperature was 100°. There was considerable vaginal bleeding. The following morning an examination under anæsthetic and a dilatation and curettage was done.

There was considerable blood clot in the vagina. The cervix was dilated one and one-half fingers. A piece of tissue was protruding through the cervical canal. The uterus was in good position and the size of a grapefruit. It was firm in consistency and the adnexa seemed normal. The uterus was curetted and also packed. A blood transfusion of 450 c.c. was given.

The next day the patient's condition was improved. Breasts were pumped every four hours for her baby. On May 16 there was very little flowing. There was very little flowing from now until her discharge from hospital on May 29.

The pathology report showed blood clot and decidua. Reparative changes in endometrium, probably post-abortion.

Hæmoglobin 58%, red blood cells 3,030,000. No A.Z. test done. Urinalysis normal.

On June 1 patient returned to hospital complaining of pain in the lower abdomen and vaginal bleeding. She stated she began to bleed a little two days after her discharge from the hospital. The bleeding kept up and gradually got worse. The patient was packed per vaginam and given a blood transfusion. On June 5 a dilatation and curettage was done and she was examined under anæsthetic. The uterus was the size of a three months' pregnancy and contained blood clots.

Curettings revealed a chorionepithelioma.

A.Z. test June 12 strongly positive with 1 c.c. of urine. Hæmoglobin 50%, red blood cells 4,390,000. The urine showed a trace of albumin.

June 12.—X-ray of the chest showed no evidence of malignancy.

June 14.—Pan-hysterectomy done. Postoperative course was fairly satisfactory. She was given the necessary intravenous therapy.

Pathological report.—Chorionepithelioma of the uterus.

June 21 and 30.—A.Z. test strongly positive.

July 15.—Radium was used per vaginam.

August 3.—Hæmoglobin 45%, red cells 3,800,000.

August 5.—X-ray of the chest showed extensive secondary chorionepithelioma of the lungs.

August 16.—Lung lesions increasing by x-ray film.

August 20.—Patient was allowed to go home.

On September 5 she was re-admitted complaining of vomiting continuously. There were no palpable abdominal masses. Patient was thin and pale. The temperature was 101° and the pulse rate 130. The patient was treated symptomatically without improvement and was again allowed to go home, September 26. About two weeks later she died at home.

CASE 4

Mrs. E.S., aged 22, para 1. This patient was the wife of an airman. She had been married less than a year. When she was three months' pregnant she had an incomplete abortion. Some fragments were said to have been removed at her home by her family doctor. She states a gloved finger was used, but not an instrument. The bleeding stopped about ten days later, and there was no further bleeding for about a month when it began again. She thought this was a return of her menstrual periods, but it continued. She took some medication to check it, but it did not stop. The patient lived at home with her mother in the country and on account of the very deep snow during the winter of 1943 she was unable to contact her doctor readily. She moved with her husband in June, 1943, to St. Thomas where she was seen by another physician. At this time I was asked to see her in consultation after her family physician had made a diagnosis of chorionepithelioma. The patient was removed to Victoria Hospital with the expectation of using radiation treatment.

The patient required several blood transfusions during her first few days in the hospital. She also required firm vaginal packing to control the hæmorrhage. On admission the findings were as follows:

Patient appeared pale with a waxy tint to the skin. The temperature was 101, pulse 110. Blood pressure was 110/70; hæmoglobin 60%. Friedman test strongly positive.

There was an extensive ulceration extending up into the right fornix, and the cervix was partly involved. The uterus was the size of a three months' pregnancy and fixed. The bleeding was coming from the larger vessels in the region of the broad ligament.

Pathological report of tissue taken at the time of the packing showed chorionepithelioma (difficult to find). X-ray of chest did not reveal any signs of metastatic growths.

Deep x-ray treatment was started for this patient a few days after admission. She went down hill rapidly and died one week after admission to the hospital. A post-mortem of the pelvis was done. It showed chorionepithelioma of uterus with extension to the vaginal vault complicated with marked hæmorrhage.

SUMMARY

1. A brief review of chorionepithelioma has been given.
2. Four cases of chorionepithelioma have been reported. Two of these are alive and well seven years after operation and two have died.
3. One of the four was associated with a hydatidiform mole.
4. Three cases followed an early pregnancy or abortion, and one followed a full term labour.
5. Early diagnosis depends upon, (a) history of continued bleeding after an abortion or labour; (b) the pathological report of the curettings; (c) a positive Friedman test. This

test is commonly strongly positive even in diluted solutions.

6. The importance of a thorough investigation of any unusual bleeding following an abortion or even a full term labour must be emphasized. A diagnostic curettage and a Friedman test are of paramount importance and these should be done early, *not late*. We are not justified in waiting in these cases, nor are we justified in treating them with ergot, etc., until we have made a proper and final diagnosis. The Friedman test when strongly positive is most dependable for diagnosis.

7. Pan-hysterectomy for all suitable cases gives the best hope for a cure.

REFERENCE

1. WILLIAMS, J. W.: *Obstetrics*, Stander, 8th ed., Appleton-Century, N.Y., p. 735, 1941. This has an excellent historical review of the whole subject.

VIBRATION SYNDROME*

By C. R. McKinnon, B.A., M.D. and
W. N. Kemp, B.A., M.D.

Vancouver

THE marked increase in the use of pneumatic tools during the war years 1941 to 1945 in the greatly expanded ship building industry in Vancouver, B.C.,—and to a lesser extent in the airplane manufacturing industry—led to a very definite increase in the incidence of temporary total disability arising from their use. We have seen approximately 150 working men and women complaining of a symptom complex to which, for want of a better name, we have attached the term "Vibration Syndrome".

According to Desoille, compressed air was used in the mines of France as long ago as 1839 but it was not until 1883 that pneumatic tools were first put to practical use in American industry.

Regardless of its purpose, the pneumatic tool or "air gun" consists of the following component parts: (1) a distribution box enclosing the air and containing a piston capable of a to-and-fro movement which is imparted by the compressed air acting alternately on each of its surfaces; (2) the tool to which the piston transmits its movements. The form and weight

* Delivered before the Medical Staff of the Workmen's Compensation Board of British Columbia, at Vancouver, March 21, 1945.

of the tool varies according to its application; the speed of the piston may vary from 250 to 1,500 or even 4,000 strokes per minute.

The first report of general symptoms following the use of pneumatic tools was made by Corsini in 1907 in Italy, and later by Loriga who was the first to describe the reduced sensibility and ductility of the fingers associated with numbness and ischæmia of terminal phalanges.

In 1918 Leake, Rothstein, Edsall and Hamilton¹ reported concerning a condition known among the working men as "dead fingers". They noted the following facts: workmen using pneumatic tools were likely to incur vascular disturbances in the form of a limited type of local anæmia of the fingers which were rendered stiff and temporarily unfit for work. The fingers of the hand holding the chisel were most generally affected. The numbness and tingling would pass off after a period of rest or warming the hands. "Dead fingers" was noted in 3 of 15 sandstone cutters (all formerly employed in marble); in 34 out of 38 limestone cutters; in 43 out of 50 granite workers and 44 out of 78 marble workers. In the latter group the lesser incidence of symptoms was accounted for by the better heating of the workshop and the use of smaller chisels.

In 1925, Middleton and Bridge in Great Britain noted circulatory disturbances similar to the above in users of pneumatic tools. They were inclined to attribute them to the pressure of the gun impeding the circulation in the deep and superficial palmar arches and also to the effects of the coldness itself.

In 1930 Maria Seyring reported that 92 of 189 cleaners of cast-iron articles in a large metallurgical works where pneumatic tools were used, complained of dead fingers. It was reported that low temperatures in the place of work or exposure to cold water often precipitated an attack. In some cases especially after a prolonged period of work, numbness of the hand or even of the whole arm, was recorded.

In 1936, Hunt noted similar vasospastic phenomena in workers using pneumatic tools. He stated that the symptoms usually appeared after two years' work and are readily precipitated by cold.

In 1933 Hardgrove and Barker² stated that the majority of stone cutters using the pneu-

matic hammer have disturbances of circulation of the hands with blanching and numbness of the fingers when exposed to low temperatures. They stated that the hammer itself weighed 2 to 5 pounds and delivered 3,000 blows per minute. It was held in the right hand, in right-handed men, as one holds a pencil, with the chisel in the left hand. The fourth and fifth fingers, being nearer to the cutting end of the chisel, are pressed closely against it in order to guide it. It was in those fingers the symptoms first appeared and were most severe. There was no objective evidence of any disturbance of the central nervous system or evidence of injury to the larger nerve trunks. The symptoms were regarded as vasospastic in origin; the course was relatively benign.

In 1944 Barker and Hines³ reported in detail on eleven cases of proved occlusive arterial disease in hands or fingers occurring in otherwise healthy men whose hands had been subjected to blunt trauma and pressure. In this series two workmen had been using pneumatic tools. In no instance were symptoms or signs of arterial disease to be found elsewhere. They regarded the cause as occupational trauma to the arteries of the hand.

The symptomatology in the above series was informative and interesting. There was pain, coldness and discoloration of one or more fingers. When exposed to cold, the fingers blanched. In a warm environment the fingers remained colder and in some cases were cyanotic. In five cases there were painful lesions of the finger tips from hæmorrhages under the nails, or small ulcers or retracted scars. All fingers were numb at times.

Mills⁴ has reported an interesting case of pathologically proved occlusive arterial disease confined to the left leg of a "powder man" in a road construction gang. It was his job to drill the holes in rock preparatory to blasting and he followed the unique practice of holding the drill down with his left foot. The left leg was subsequently amputated. The right leg and upper extremities showed no signs of arterial disease.

Wright⁵ has pointed out that in workers using pneumatic tools, vascular disturbances similar in some respects to pregangrenous Raynaud's syndrome occur and are commonly known as "pneumatic hammer disease". Inasmuch as a similar syndrome has occurred from

other activities involving percussion, such as typing and piano playing, Wright suggests the term "traumatic vasospastic syndrome".

Compared to reported experiences of vascular disturbances, injuries to the joints are relatively infrequent. Holtzmann (1926) reported the first case of injury to a joint (shoulder) and on the strength of his clinical reports, diseases of the muscles, bones and joints caused by work with pneumatic tools were placed on the schedule of occupational diseases subject to compensation in Germany. Vossenaar (1936) examined about one thousand miners employed for a minimum of ten years using pneumatic tools; the elbows and wrists were studied radiographically. He reported that 98% of cases showed pathological manifestations in the joints, the majority being without symptoms. Rostock (1937) stated that among 1,932 miners examined in Germany, lesions of the joints were present in only 0.0081%. This latter finding is more in accord with our experience; in none of our series of 150 cases were there any significant joint manifestations.

MATERIAL

The present study is based on a series of 150 working men and women sent to the Rehabilitation Department of the Workmen's Compensation Board at Vancouver, B.C. for physiotherapy. They were individuals who had been employed in the use of pneumatic tools in the ship-building industry as riveters, caulkers, reamers, "bolters-up" and "holders-on", or in aircraft production as riveters or "holders-on". In the ship-building industry only men were employed in the use of percussion tools. Possibly a brief outline of the duties of each will be helpful here.

The steel plates were guided into position by the "plate hangers". Then it was the job of the bolter-up to temporarily attach the edges of the plates to each other by inserting a cold bolt in every other hole, using a pneumatic impact wrench to tighten the nuts. This latter tool weighs about thirty pounds and delivers between 1,200 and 3,000 strokes per minute at 90 pounds air pressure. If the bolt did not fit perfectly it was the job of the "reamer" to rebore the holes. For this purpose, he used a pneumatic tool weighing 28 pounds, driving a bit which revolved 86 times per minute with

compression at 100 pounds. It was operated by one or two men who hold on to a cross bar at the butt end of the gun. The arm and shoulder muscles of the reamers were subjected to a jerky type of vibration as the bit bored into the metal plates.

Everything now was ready for the riveter who, by means of his pneumatic gun, "mush-roomed" the head of the rivet. Opposing him on the other side of the plate was the holder-on (or bucker-up) who used a similar air gun. The latter weighed 22 to 25 pounds and delivered 1,300 blows per minute. It consisted of a cylindrical barrel at the near end of which was a handgrip with a trigger for the release of the compressed air which operated the piston-like plunger; the latter was moved to-and-fro by the compressed air alternately striking and receding from the end of the die, this latter being a movable tool of hardened steel with one end fitting into the distal end of the barrel of the gun. The die was held in position by the gloved hand of the workman.

After this team had completed their riveting the caulker came on the scene and closed the seam between the plates by a chiseling process using a gun weighing twelve pounds and delivering 2,000 blows per minute.

The incidence of vibration syndrome, as one would expect, was greatest in riveters (40%), holders-on (25%) and caulkers (22%). Reamers and bolters-up escaped with a comparatively light incidence of 9% and 4% respectively.

The ages varied from 20 to 50 years the majority being between 25 and 35 years of age. There was no relationship established between body weight and proneness to develop symptoms. There was however a definite relationship to experience and overwork. The vast majority of workmen (90%) seen by us had not had any experience with pneumatic tools prior to 1941. In many—if not most—the onset of symptoms was attributable to inexperience and the desire to augment their financial returns—all being employed on a piece work basis. They worked in teams and by working quickly and for longer hours the highest paid member of a team, the riveter, could make as much as thirty dollars a day.

In the airplane manufacturing industry the majority of the riveters and holders-on were women. Their job was to flatten the cold rivets holding the duraluminum plates of the airplane

together. For this purpose a light gun weighing only five pounds (approximately) and striking about 1,200 blows per minute was used. It was noted that when Flying Fortresses were being built there were comparatively few instances of the syndrome but when a switch-over was made to Super-Forts with heavier plates and rivets the incidence of symptoms was trebled.

Like the shipyard workers these women working in aircraft production were inexperienced in the use of pneumatic tools. Furthermore it was noted by the writers on a visit to the plant that in many instances the riveters would be working overhead with their arms stretched upwards in an unsupported position. Many when working "on the level" would have their sleeves rolled up above the elbow. The position of the sleeves together with acute flexion of the elbow could not but interfere with the blood supply of the forearm and hand. Holders-on also followed this practice. As an additional predisposing factor the latter workers used comparatively small blocks of light metal to absorb the shock of the riveter's gun.

PREDISPOSING FACTORS

We have mentioned several factors which might well be regarded as predisposing. These may be summarized as follows: (1) Inexperience and lack of skill in taking proper stance and arm posture while at work. (2) Overtime work and overwork induced by payment on a piecework basis. (3) Cold weather.

SYMPTOMATOLOGY

The vibration syndrome is essentially one of symptoms: subjective findings predominate and objective findings were few. The onset was insidious often commencing several months before the time when the workman was forced to seek medical aid. In right-handed workers symptoms usually began in the right hand; occasionally both hands are affected. There was first, numbness and tingling of the little, ring, and middle fingers in riveters, and of the thumb and index finger in caulkers. The workman complained of burning in the palm of the hand and of swelling of the thenar and hypothenar eminences. His grip became so weak that he could not grasp the tool. In many instances there was blanching of the fingers, especially in cold weather, and in some cases an appearance similar to Ray-

naud's disease has been noted. The affected hand felt cold all the time and when it was placed in warm water for pain relief it had a higher heat tolerance; after prolonged immersion it became congested and red with an increase of pain. Immersion in cold water often caused blanching and cyanosis and led to an immediate increase in discomfort.

Increased local perspiration of the hand has been noted in some instances. We have not seen trophic changes in the nails or the skin nor have any cases of gangrene occurred. Workmen reported, however, that slight traumata or infections of the affected hand were slow in recovery.

Symptoms were often worse in the early morning. Some workmen related that in the morning their hands were often so stiff and numb that they were unable to grasp their gun satisfactorily until they gave it a few bursts on a piece of steel to warm it up. All workmen have found that their symptoms were more severe when working overhead for long periods in a position in which they could not support their "gun arm" against their body or thigh in the usual way.

If the workman continued to use an air gun the condition progressed and symptoms in the hand became more severe. In addition he had cramps in the forearm, upper arm and even in the shoulder muscles and sometimes in the cervical region. Some localized the pain to the external epicondyle with radiation distally along the extensor surface of the forearm. At this stage slight trauma to the elbow causes severe disability with marked aggravation of symptoms. Not infrequently this minor trauma was the reason given by the workman to account for his inability to work. There is usually weakness of flexion and extension at the wrist and elbow and weakness of rotation of the forearm; resistance to these movements caused pain.

In some of the more advanced cases there was intention tremor when purposeful movements such as buttoning a jacket or picking up a cup were attempted. When the workman was sitting in a chair reading the newspaper with his arms slightly elevated paræsthesiæ were of frequent occurrence.

The majority of workmen stated that the symptoms were more severe at night after retiring. They described "a dead, gnawing ache in the arm" and had great difficulty in placing the upper extremity in a suitable position for sleeping. Many had to arise two or three times

during the night, soak the arm in warm water and have someone massage it. This resulted in broken rest, increased anxiety and some times in mental depression.

CLINICAL FINDINGS

We have already noted the fact that workmen exhibited few objective findings. There was seldom any atrophy. Occasionally there was hypoesthesia in the fingers and palms without any characteristic nerve distribution. Epieritic sensibility was usually dulled but protopathic sensibility was seldom involved. Nor have we seen any astereognosis in this series. The deep reflexes were usually hyper-active; responses to faradic or galvanic stimulation were normal. There was often generalized tenderness to deep palpation over the whole extremity and, in some instances, tenderness over the brachial plexus has been noted. Varying degrees of restriction of voluntary movement have been seen in the various joints, the passive range usually being greater than the active. Almost all had weakness of grasp. In some there was acute tenderness on and about the radio-humeral articulation.

DIAGNOSIS

The diagnosis was readily made when the previous history and the circumstances under which the disability arose were carefully reviewed.

In the differential diagnosis one has to keep in mind organic nervous disorders, cervical rib, scalenus anticus syndrome, Raynaud's disease (particularly in women) thromboangitis obliterans, acrocyanosis and erythromelalgia.

PATHOLOGY

Little is known concerning the pathology of this syndrome. Barker has described a condition which he termed "pneumatic hammer disease" due apparently to a vasospastic disturbance in the hands. More recently the same writer³ reported 11 cases (two of whom were users of pneumatic tools) of occlusive arterial disease occurring in the hands of otherwise healthy men whose hands had been subjected to "blunt trauma" and pressure. In these cases the diagnosis was confirmed by roentgenological studies following the intra-arterial injection of suitable opaque media.

Kerr⁶ inclines to the view that injury to the nerves, including the vasomotor nerves, is the important lesion. Cook⁷ who has reported 32 cases (some of which are included in our series)

considered that in the early stages it is a "fatigue syndrome" which, if long continued may lead to inflammatory reactions or even structural or organic changes of a more or less permanent nature in the "neuro-muscular system".

Most of the evidence seems to suggest that the pathological change lies in the vascular system of the extremity. At first this probably consists of occlusive vasospasm which, if trauma is continued, might conceivably progress to the stage of permanent occlusion as in the case reported by Mills.⁴

TREATMENT

After trying all of the known physiotherapeutic modalities, separately and in combination, and including rest in complete immobilization, we have come to the conclusion that our present method gives the best results. With the patient lying on his side, the whole upper extremity, including the shoulder, is extended into a specially constructed cabinet in which steam is generated under control, the temperature being maintained between 115 and 120° F. By this method the entire extremity is heated, the muscles are relaxed and blood flow and metabolism are increased. After 20 minutes, effleurage, a very gentle type of light massage, is administered to the whole extremity. The workman is advised to keep the upper extremity warm at all times enclosing it in a woollen garment and wearing a glove when the weather is at all cold.

Under this regimen all patients have shown improvement with one exception. This latter was a difficult case markedly complicated by psycho-neurosis, who apparently had, in addition to the usual symptoms, a partial paralysis of the abductors of his right shoulder. He was very dramatically cured by Dr. G. Davidson by suggestion while under sodium pentothal analgesia.

On the average, six weeks was the maximum time-loss necessary for treatment. Before this period was up—sometimes after only two or three weeks of treatment—the workman would be assisted in finding some other type of employment. In no case would the Board condone a return to the use of pneumatic tools. Occasionally a workman went back to part-time work before treatment was discontinued.

The psychological factors associated with this disability must not be disregarded. Some of the more advanced cases are genuinely anxious

about "becoming paralyzed". Here an optimistic outlook and full reassurance concerning their future employability is necessary.

CASE REPORT

A.H., a caulker, aged 37.

Past history.—Has always been well. Previous to employment as caulker was a fisherman and sawmill worker.

History of present condition.—Since August, 1942, has worked steadily as caulker except for one week's holiday in 1944 and three weeks' lay-off for injury to his hip in 1943. For past year he has had symptoms but carried on without time loss until April, 1945.

Symptoms at first were chiefly in his right hand and consisted of "dead fingers". At the end of his shift, or on the way home from work the skin of the index finger would become blanched and shrunken with marked loss of feeling. Occasionally he had "cramps" along the ulnar border of the hand. The next morning the hand would be stiff. Relief of pain was obtained by soaking his hand in warm water. If immersion were too prolonged, however, severe pain would occur with swelling and burning "just like thawing out after partial frost bite". As symptoms progressed, his grip weakened and he noticed discomfort along the extensor surface of the forearm with maximum intensity about the elbow. The elbow became stiff with some decrease in freedom of movement. Workman is ambidextrous and symptoms were present in both hands and forearms.

Examination showed weakness of grip; resisted movements caused pain in forearm; there was tenderness on deep palpation of the forearm. No other findings of note.

Treatment consisted in heat (steam cabinet) and massage, and after four weeks' treatment, return to different employment.

The principal treatment is prophylactic. When the earliest symptoms are reported to the First Aid attendant, the workman should be immediately taken off "the gun" and given some other employment. We feel that under ideal conditions of industrial supervision actual treatment and time loss for vibration syndrome would not be necessary.

SUMMARY

The history, symptomatology, diagnosis and treatment of vibration syndrome (pneumatic hammer disease) has been discussed, based on a review of 150 cases treated. The essential feature of treatment is rest, moist heat, light massage and reassurance for potential anxiety neurosis. The authors believe that actual treatment would be unnecessary if workmen were warned to report early symptoms. In any event, treatment includes a change of employment with the abandonment of the use of pneumatic tools.

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RÉSUMÉ

Le "syndrome de vibration" est fréquent chez les ouvriers des chantiers maritimes et chez ceux qui utilisent les outils du type perceur mécanique à air comprimé. Ces sujets présentent des engourdissements, de la douleur et du refroidissement des mains, la droite surtout. La symptomatologie est la résultante d'une vaso-spasticité artérielle tendant à amener l'occlusion plus ou moins permanente des artérioles des mains. Le traitement comprend le repos, la chaleur humide, le massage et la psychothérapie. Le diagnostic précoce facilite la thérapeutique et diminue la durée de l'incapacité. Les sujets atteints doivent changer d'emploi. Découvert et traité à temps, ce syndrome comporte un pronostic favorable.

JEAN SAUCIER

RESUSCITATION OF THE SEVERELY WOUNDED

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THE following account is based on the experience of the author with a Field Transfusion Unit (F.T.U.)¹ serving with the First Canadian Army in the North-West Europe campaign from July 10, 1944, till the capitulation on the 21 Army Group front on May 5, 1945. During this time over 1,500 severely wounded casualties were seen in the resuscitation wards of various Casualty Clearing Stations (C.C.S.) and Field Dressing Stations (F.D.S.) and of this number approximately 1,200 were transfused with whole blood, plasma, or both.

The operation of a resuscitation ward can best be illustrated by following the course of a hypothetical casualty through the Advanced Surgical Centre. John Doe, aged 24, is admitted to X. Canadian C.C.S. at 0400 hours, October 24, 1944. On the envelope of his Field Medical Card there is a Priority I label so that the admitting officer wastes no time examining him but has him sent through immediately to the resuscitation ward. There he is immediately seen by the resuscitation officer. The patient's card shows that he was wounded at 0100 hours, October 24, that he has had ½ gr. morphine, 1 c.c. tetanus toxoid, and 500 c.c. plasma at the Advanced Dressing Station

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(A.D.S.); diagnosis: shell wounds, multiple, both legs, thighs and buttocks, compound fracture left femur. The patient's present condition is assessed while one of the orderlies fills in the pertinent details in the record book.

The findings are as follows: pulse, 136, blood pressure 60/20, skin and mucosæ extremely pale with dusky cyanosis, and coldness of the nose, ear lobes and extremities, tongue dry and fissured. The wounds are not examined at this point beyond checking the dressings for evidence of bleeding. It is decided that the patient is in extreme shock and transfusion is started immediately without disturbing the patient further, even to undress him.

Fluid plasma is used to start this transfusion because of the short time required to prepare and administer it. After about five minutes, when the bottle of plasma is almost used up, the blood pressure and pulse are again taken and the dressings briefly re-inspected to check for fresh bleeding, then a bottle of warmed Group "O" blood is administered. The transfusion is continued as there has been no pulse or blood pressure response.

Forty-five minutes later, after 500 c.c. plasma and 1,200 c.c. whole blood, his blood pressure has risen to 95/50, the pulse is slightly lower at 120 and he feels more comfortable. With as little disturbance as possible his clothes are now cut off and rolled from under him and dry warm blankets are rolled under and spread over him (in less extreme cases this was always done immediately on admission). The whole body is now thoroughly examined for possible wounds undiscovered previously. If there is any doubt as to the size or nature of any of the wounds the dressings are changed. In all cases with high thigh and buttock wounds the abdomen is carefully examined and digital rectal examination done to rule out a rectal lesion. If the patient cannot void, a catheter is routinely passed to rule out a bladder lesion.

Two hours and ten minutes after admission, 500 c.c. plasma and 2,000 c.c. whole blood have been given; the pulse is now 120, the blood pressure 105/60 and the colour much improved. It is decided that nothing would be gained by further transfusion therapy before operation. A brief visit is paid to the operating rooms to discuss the case with the surgeon while he is still working on the previous case. The patient is given omnopon 1/3 gr. with scopol-

amine 1/150 gr. intravenously and fifteen minutes later is carried into the operating room. There the anæsthetist takes over the responsibility of the transfusion though it is customary to consult the transfusion officer when necessary. In the postoperative ward the officer in charge looks after the routine of postoperative transfusion while any problem cases is discussed with the surgeon and the transfusion officer. Some of the points mentioned briefly in the above description will now be discussed more fully.

ASSESSMENT OF DEGREE OF SHOCK

Owing to the large numbers being dealt with and the urgent need for early treatment, a rapid decision as to the severity of the casualty's condition was necessary. None of the usual criteria of shock were found adequate individually as they were all too variable. In extreme cases, the blood pressure, usually thought of as a very important feature, was often not taken till transfusion and other appropriate measures had been started. Assessment must be made not on any one factor but on the whole picture.

Blood pressure.—The systolic blood pressure may be low, normal or elevated as high as 190 to 200 mm. Hg and yet from the rest of the clinical signs it will be obvious that the patient is in shock. This confirms the observations of Lathe and Cleghorn,³ Grant⁴ and others. The more gravely shocked patients did however, tend to have low blood pressure.

Pulse.—With few exceptions this was a most useful sign. Rate, volume and tension all have importance in this connection. Almost without exception a rapid (96+) pulse in a recently wounded casualty was evidence of hæmorrhage sufficient to require fluid replacement. In some cases the pulse was normal or slow indicating a vagal rather than a sympathetic response.

Colour.—This too was an invaluable sign. While after exposure to cold and wet even the most trivially wounded might show acrocyanosis, it was not difficult to differentiate the extreme pallor and dusky cyanosis of the severely wounded. The colour of the mucosæ, especially the tongue, is of particular importance. The tongue also provided a useful sign in its degree of moistness.

Extent of tissue damage.—When extremities only were involved it was possible in some cases

to use the volume of tissue damaged as a criterion of the severity of the patient's condition. This method was recommended by Grant⁴ but was not found generally useful by the author because of the intrinsic difficulty of estimating the amount of tissue damage from the external appearance of the wounds. This is especially true when a body cavity is penetrated. However, all wounds were carefully examined as quite often they enabled the path of the missile to be estimated and also the organs involved. Wounds of certain regions were found to be especially shock-provoking; this will be discussed below under treatment.

TREATMENT: GENERAL MEASURES

The classical treatment of shock includes rest, relief of pain, warmth, and copious fluids. With the first of these we have no quarrel, but the other three require further discussion. As far as possible our patients were made comfortable by adjusting their position, by re-splinting and changing dressings where these were uncomfortable, by removing all clothing except where incorporated in splints, and by reblanketing with warm dry blankets.

Relief of pain, morphine.—Morphine was not used frequently in the resuscitation ward as most of the casualties had received at least adequate dosage before reaching our level. Overdosage was quite frequent, especially when $\frac{1}{2}$ gr. syrettes were in use; the tendency was to give the full dosage of the syrette uniformly. Though this dosage is recommended in the Field Surgery Pocket Book, 1944,² for all severely wounded, including chest cases, it was found generally too high and especially for the last mentioned type of casualty. In our experience $\frac{1}{6}$ to $\frac{1}{4}$ gr. morphine given intravenously proved much more effective than higher doses given hypodermically or intramuscularly. It is well known that the peripheral circulation is very sluggish in these cases and the absorption of parenterally injected substances correspondingly slow. If the smaller dosage given intravenously does not relieve the pain it is my opinion that further dosage is dangerous and it is better to withhold it and try verbal encouragement. Fortunately, pain is not a prominent symptom in the vast majority of the severely wounded, but the patient who does experience it presents a difficult problem.

Warmth.—It is generally held at present that excessive warmth is dangerous for patients in shock. On the other hand too cool an environment is uncomfortable and conducive to a high incidence of chills. On occasions when the ward was unavoidably cooler than desirable, chills were not infrequently observed in patients even before transfusion. We aimed at a comfortably warm ward (about 80° F.) since the patients were frequently exposed for examination, change of dressings, injections, etc. This also obviated the necessity for the use of hot water bottles except as described below. Warmed blankets were used but these were hardly more than 90° F. by the time they reached the patient and rapidly came down to skin temperature. They were found very comforting and were considered safe, as they provided a diffuse source of heat of low intensity as contrasted with hot water bottles. The latter were only used with caution after the blood pressure had come up to fairly normal levels, to make a patient with a chill feel more comfortable. Local heating of injured extremities was always avoided.

Fluids by mouth.—Contrary to prewar advice, fluids by mouth were given only in small mouthfuls when requested and were never forced. Vomiting was found to be a frequent concomitant of shock; whether it was induced by the morphine all these patients had had or was part of the shock syndrome it is hard to say. In any case it appeared that vomiting was certainly encouraged by too liberal imbibing of even plain water. Another important reason for restricting the oral intake was the anaesthetic risk involved when the stomach was full. Wet gauze swabs were given the abdominal casualties to chew to relieve their intolerable thirst as they were allowed no water at all by mouth. When there was reason to suspect dehydration intravenous glucose-saline was administered.

Antiseptic measures.—All patients with severe wounds received penicillin and gas-gangrene antitoxin in the resuscitation ward. Abdominal casualties were given their initial dose of sodium sulfathiazole if it was considered likely that there would be any delay in operation. Head wounds were given sodium sulfadiazine intravenously or sulfadiazine *per os*. If tetanus toxoid had not been given at the A.D.S. it was injected here.

TREATMENT: SPECIFIC, TRANSFUSION

In general transfusion was begun in every case where the initial systolic blood pressure was under 100, where the other physical signs and extent of injury indicated the need for protein fluid replacement, or where the nature of the surgical intervention indicated by the wound would likely cause shock. The last indication applied to all penetrating abdominal injuries no matter what their preoperative condition.

Rate of transfusion.—Except for chest cases, the special treatment of which will be discussed below, rapid transfusion of at least 500 c.c. plasma was practised where the blood pressure was low or the other signs indicated severe shock. By rapid transfusion is meant a rate of 50 to 100 c.c. per minute. This speed was achieved by pumping air into the air inlet of the giving set with a rubber bulb pump. The air inlets were provided with air filters and non-return valves so that the pressure was maintained in the bottle for several minutes. In general, in the more severely shocked cases 1,500 to 2,000 c.c. protein fluid might be poured in at this rate, depending on the response. As the blood pressure comes up over 100 systolic the rate is slowed first to a fast drip and then to a moderate drip (80 drops per minute) until the patient goes to the operating room. Where the initial blood pressure is normal or high, rapid transfusions of large amounts are not given. Whenever positive pressure is used careful supervision of the transfusion is necessary to avoid air embolism. After the first 500 c.c. the patient must be watched carefully for signs of respiratory distress or fulness of the external jugulars, and from time to time the lung bases must be auscultated for impending pulmonary oedema. These complications were rare.

It must be remembered that we were dealing with a selected group of previously healthy young males. On occasion, when we had to treat older civilians it appeared that they were less tolerant of very rapid transfusions. When dealing with children, too, it should be remembered that a rate of 100 c.c. per minute is proportionately much more rapid replacement of the circulating blood volume than in the adult and is probably excessive.

Following the initial transfusion in the resuscitation ward a continuous drip was always maintained throughout operation and for several hours afterwards. In cases of postoperative shock further rapid transfusions might be given.

Abdominal cases, of course, were maintained on intravenous fluids for five or more days postoperatively.

Irreversible shock.—In some cases with extensive tissue destruction there was no blood pressure or other response even after rapid transfusion of 3,000 c.c. or more of protein fluid. In these cases it was usually decided in consultation with the surgeon to do a debridement of the wound, as the absorption of toxic tissue autolysates and early massive infection must both be considered in the etiology of the shock state. Occasionally such cases would recover slowly postoperatively, more often they would die, usually in the first twenty-four hours.

Choice of transfusion fluids.—Contrary to pre-war clinical experience of secondary shock, battle casualties for the most part show hæmodilution rather than hæmoconcentration (Grant,⁴ Dacy and Homer⁵). This was confirmed on the occasions when we did an initial hæmoglobin. Evidently, the type of shock encountered was essentially hæmorrhagic, though other factors such as pain, tissue autolysates, etc., probably played a considerable rôle. In the field it was customary to transfuse with a proportion of 1 plasma to 2 to 6 of blood. Theoretically most cases should have had whole blood only, but there were several advantages to using a proportion of plasma. First, fluid plasma is ready to use, being stored at room temperature; secondly, its viscosity is much less than that of blood and it can be injected at a rate of about 100 c.c. per minute under positive pressure while blood will not easily flow more rapidly than 40 c.c. per minute with the equipment we were using. Another disadvantage in the use of blood stored 7 to 21 days, subject to considerable shaking in travel over rough roads as well as unavoidable temperature fluctuations en route, was the rapid destruction of the red cells after transfusion. Jaundice was seen in approximately 1% of cases. Post-traumatic anuria was seen occasionally and never coincided with jaundice in our cases.

Resuscitation by means of plasma only or a high ratio of plasma was practised on several occasions, but never on the more severely shocked casualties. It appeared to be as effective as whole blood in its immediate effect but the Hgb. was reduced to undesirably low levels, e.g., 7 to 8 gm. per 100 c.c., and repeated transfusions of whole blood had to be given postoperatively. It has been suggested (Dacy⁵) that it may

actually be dangerous to further dilute the blood in cases of severe hæmorrhage. Resuscitation by plasma alone would appear justifiable for an emergency where only plasma and rather old stored blood was available and fresh blood could be collected during subsequent days. This refers of course only to shock with hæmodilution as seen in battle casualties; in postoperative shock, burn shock, etc., where there may be considerable hæmoconcentration, the nature of the therapy will be indicated by blood studies. In the field, blood studies, even when available, were not found useful during the initial resuscitation when the assessment was essentially clinical, but they did find their use in the follow-up of the cases during the subsequent 2 to 10 days that they were held at our level.

The blood used was collected in England by the Army Blood Transfusion Service (A.B.T.S.) and by the Emergency Medical Service (E.M.S.) Transfusion Depots, and flown daily to the continent. It was triple-checked Group "O" blood diluted in a citrate-glucose solution and not treated in any way to reduce the titre of alpha and beta agglutinins. The plasma used was for the most part Seitz filtered citrated liquid plasma prepared in England by the A.B.T.S. and E.M.S., but English dried plasma and Canadian dried serum were also used. The liquid plasma was one to twelve months old. The older specimens showed a tendency to precipitate fibrin and were more likely to produce pyrogenic reactions. The blood reached the F.T.U.'s at an age of 4 to 7 days and was kept till 21 days. If possible the use of blood older than 14 days was avoided, especially where a large volume would likely be given. Specimens showing more than slight hæmolysis of the supernatant plasma were discarded regardless of age. Transfusions of fresh blood obtained from members of the parent medical unit were occasionally given, but this was limited by the fact that it was a time consuming procedure and by the small number of donors available in a medical unit.

Warming of blood.—While some authors recommend the transfusion of blood at refrigerator temperature and state that it is no more productive of reactions than warmed blood (Rhea, Denstedt *et al.*,⁶ DeGowin⁷) this was not my experience. It was found that when transfusions were given at a rate faster than a moderate drip (80 drops per minute) severe chills were induced by cold blood which could

be averted by warming the blood to at least room temperature. When cold blood was transfused the patients would complain of coldness of the arm receiving the transfusion and inevitably a chill would follow. The vein could be felt as a cold cord as high as the axilla. Blood was warmed by immersing the bottles in water comfortably warm but not hot to touch (35 to 40° C.) for about ten to fifteen minutes with repeated mixing by inversion during that time. It should be emphasized that nurses and orderlies must be taught the danger of overheating blood; this is simple if they are taught that water which is too hot for their hand is too hot for the blood. As there is a possibility of damage to the red cells in pre-transfusion warming of blood it is considered necessary only when the blood is to be transfused rapidly.

Selection of a vein.—While apparently a trivial matter too much trouble can not be taken in the selection of a suitable vein for transfusing a severely shocked casualty. The largest vein in the antecubital fossa should be chosen for the initial rapid transfusion. The veins of the forearm usually have not the capacity for the rate of transfusion required initially. When even the antecubital veins are too collapsed an attempt may first be made to dilate them by gentle warming of the arm for several minutes, by flicking the skin over the vein with the finger, and by one to two minutes arterial constriction by means of the blood pressure cuff. If these measures fail we have found it convenient to use the external jugular vein for transfusion. This can always be entered even in a moribund patient if an assistant occludes it with his finger immediately above the clavicle. It has the theoretical advantage that the blood given is rapidly brought to the right heart, but more to the point it is a practical way of rapidly restoring a large volume of fluid to the circulation. The veins of the lower extremity should be avoided for rapid transfusions. The great saphenous and its branches are very muscular and go into spasm if an attempt is made to introduce blood or plasma under pressure. For this reason, cut-down at the ankle, though often practised postoperatively where a slow drip infusion had to be continued for several days was rarely done in the resuscitation ward.

Incidence and nature of transfusion reactions.
—Minor chills lasting five to ten minutes were

frequent and as mentioned above the frequency depended in large measure on the temperature of the transfused fluid and the rate of transfusion. Severe rigors were rare, not more than 0.5%. In several cases a bottle of blood which caused a severe rigor in one patient was cautiously tried on another and found innocuous. Possibly these are examples of the effect of high titre alpha and beta agglutinins in the transfused blood (Group "O") or possibly due to Rh factor. We were unable to follow up such cases. During rigors there would be elevation of both blood pressure and pulse rate. It is important to distinguish such a rise in blood pressure from one due to adequate fluid replacement. Urticaria was seen in approximately 0.5% of cases; it was not considered a contraindication to the continuation of the transfusion. Occasionally a localized urticaria was seen along the path of the vein receiving the transfusion. This was common after the use of omnopon in the tubing but was seen occasionally when no drugs had been given by this route.

RESUSCITATION COMPLICATED BY WOUNDS OF SPECIAL REGIONS

Head.—Large penetrating wounds of the cranium were frequently accompanied by considerable hæmorrhage from the scalp and meninges, and these patients were not infrequently seen in a state of oligæmic shock as well as concussion. This produces a confusing picture. The state of the peripheral and neck veins is very important in these cases in judging whether the patient is suffering from oligæmia as well as concussion and increased intracranial pressure.

Chest.—Much has been written of the danger of rapid transfusion in casualties with penetrating or crushing injuries of the chest yet such treatment was often found to be a deciding factor in their response. However, it is true that these cases required very careful assessment and watching. Rest, oxygen, intravenous morphine, and aspiration of the hæmothorax or hæmopneumothorax where present usually gave considerable relief. It may be mentioned here that intravenous morphine has a more dramatic effect on this type of casualty than on any other. One can see the slowing and deepening of respiration and relaxation in a matter of minutes. Where an open or sucking wound was present it was always occluded

at the R.A.P. or A.D.S. but not infrequently these dressings would need reinforcement after a bumpy ambulance journey. These patients were given the highest priority for surgery.

In the chest case even more than in the head case the state of the external jugulars was found to be a valuable sign. When these are collapsed, transfusion is undoubtedly beneficial, where they are full it is unnecessary and probably dangerous.

It was found that thoracic shock differed from wound shock generally in that the return of the blood pressure to normal level was usually much more prolonged. Also, oligæmia does not seem to play as important a rôle here as in wounds in other regions. A low blood pressure and other signs of shock were not infrequently seen without evidence of oligæmia, i.e., the peripheral venous system was full. In these cases the blood pressure would rise and the general condition improve slowly over several days with rest, oxygen, aspirations, etc. This is in line with the shock-like syndrome seen in thoracic crises such as coronary thrombosis, pulmonary embolism, etc.

Spinal.—This was the one type of case which occasionally benefited from the use of vaso-pressor drugs. Otherwise these drugs were not used in the resuscitation ward though they were sometimes of benefit on the operating table.

Burns.—Severe burn cases were not often seen; the majority were accidental in origin. This is the one type of case where initial blood studies are not only helpful but necessary.

SUMMARY

Observations and recommendations have been made regarding the resuscitation of the severely wounded based on experience with a F.T.U. throughout the N.W.E. campaign. The assessment of the degree of shock has been described with a discussion of the value of the various criteria. General and specific measures used in treatment have been described. Special reference has been made to the treatment of casualties with wounds of special regions, such as the head and chest.

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RÉSUMÉ

Les problèmes de la ressuscitation des grands blessés varient avec la gravité du choc et la localisation des blessures. Il existe maintenant des critères qui permettent d'évaluer la gravité du choc. Le traitement comprend des mesures générales à peu près toujours les mêmes, et des mesures spéciales qui varient selon la localisation des blessures, l'état de la tension artérielle, le taux de concentration du sang et les produits que l'on a à sa disposition. Les blessés du crâne et du thorax ont la priorité et sont soumis à une technique thérapeutique spéciale succinctement décrite.

JEAN SAUCIER

CASE REPORTS

ADVANCED ABDOMINAL PREGNANCY*

By P. Coodin, M.D.

Fort William, Ont.

Full term abdominal pregnancy is an unusual occurrence, but not as rare as is generally supposed. Anyone doing obstetrics may at any time be faced with the diagnosis and treatment of such a case. The following case is reported to illustrate some of the difficulties and complications of abdominal pregnancy.

Mrs. E.B., aged 29, primipara at full term, was admitted for delivery to the obstetric ward of McKellar General Hospital, on June 3, 1945. Her last menstrual period occurred on August 22, 1944 and she was due for confinement on May 29, 1945. Since that day she had backache and pains in the mid-abdomen coming on at irregular intervals. The backache was constant, and very annoying allowing her very little rest for the past three nights.

Her menstrual history was normal. The family history was negative except that her mother's first pregnancy had been complicated by pernicious vomiting, serious enough to require its termination by emptying the uterus.

She had been first admitted to this hospital on November 9, 1944, when she was about three months' pregnant. At that time she complained of constipation, nausea, vomiting and intermittent cramps in the upper abdomen which she described as gas pains. These cramps came on every hour and were often followed by vomiting. She could retain no food by mouth. Her admission temperature was 99.4° F., pulse 84. The general physical examination was negative. Blood pressure 104/72. Pelvic examination showed a softened cervix and lower uterine segment. The uterus was about the size of a medium orange and the fundus reached the level of the pubic symphysis. The Fallopian tubes and ovaries could not be palpated. There was a trace of albumin in the urine with 4 to 7 leucocytes and many epithelial cells per high power field. The blood urea nitrogen was 11 mgm. %. There was no jaundice.

* Read before the Thunder Bay Medical Society, October 18, 1945.

On November 14, the patient fainted while in the bathroom and was seized with violent cramps in the back and lower abdomen. For the next two days her gas pains in the epigastric area recurred more frequently and she became quite miserable from vomiting copious amounts of thick coffee-ground fluid. There was an elevation of the temperature to 100.4° F. and the pulse to 120 per minute. There was no vaginal bleeding then or at any time through the rest of the pregnancy. Following this episode her symptoms gradually subsided and she was discharged from the hospital on November 23, feeling well and taking a full diet. She carried on to full term with no untoward event except for feeling vigorous but painless fetal movements during the last two weeks.

The general physical examination of the patient on her second admission was essentially negative. The blood pressure was 130/78. The abdomen showed a symmetrical tumour reaching to 4 fingersbreadth below the xiphoid process. The fetal back could be felt to the right of the umbilicus and the small parts to the left. The head was engaged deep in the pelvis. The fetal heart sounds were loudest below and to the right of the umbilicus. No uterine contractions could be felt though the patient was visibly contorted with intermittent abdominal pains. On vaginal examination one could feel the vertex of the fetal head at the midpelvis. The cervix was effaced and its position high up towards the pubic symphysis. The external os admitted one finger.

An attempt to induce labour by means of castor oil, quinine and pituitrin was made on the day of admission. This was repeated two days later, without success. Several hours after the second induction the patient felt epigastric pains and vomited clear fluid. The vomiting continued and gradually increased in amount and frequency. On June 7, she appeared acutely ill, vomiting copious amounts of dark-brown, foul-smelling fluid. The general symptomatic picture was then very similar to that of her first hospital period in November. The blood urea nitrogen was 22 mgm. %. That afternoon Dr. G. E. McCartney was called in consultation and examined the patient. Though eclampsia could definitely be ruled out in the diagnosis we were under the impression that she was suffering from some atypical form of toxæmia. Because of her exhaustion and poor general condition it was considered advisable to empty the uterus immediately by Cæsarean section.

Operation.—Under spinal anaesthesia the abdomen was opened by a midline incision below the umbilicus. The peritoneum, omentum and fetal membranes were found to be glued together by adhesions. The fetus was lying freely in the abdominal cavity, mostly on the right side. Incision of the membranes was followed immediately by profuse bleeding. A knee was grasped and a full term living male fetus removed after clamping and cutting the cord. The placenta was attached to the lateral and anterior walls of the abdomen, the broad ligament, the left ovary, several coils of small intestine and to the transverse colon. A considerable amount of old clotted blood was removed from the abdomen. The uterus was about the size of a three months' pregnancy and the left Fallopian tube was elongated and scarred. The placenta and membranes were easily separated and removed. In this process the patient went into shock and became cyanosed and pulseless. An attempt was made to administer intravenous saline on the table but no vein could be found even after cutting down in the left cubital space. Hæmorrhage became severe and difficult to control. Dozens of bleeding vessels were clamped and tied in the vicinity of the left ovary. The incision was closed without drainage and the patient was removed from the operating room in a state of semiconsciousness.

The newborn weighed about 7 lb. It showed no gross abnormalities but was a livid grey colour and could not be made to cry even after much stimulation. The respirations were shallow and sighing and there were bronchial breath sounds with fine râles scattered over

both lungs. The infant died of atelectasis 21 hours after birth.

Postoperative course.—The patient was given two transfusions of 500 c.c. each of citrated blood followed by continuous intravenous saline on the night of operation. Shock was promptly relieved and her colour returned. Two blood transfusions were also given the following day. Her blood count at this time showed 3,910,000 red cells and 68% hæmoglobin. Her temperature during the first 12 postoperative days ranged between 101 and 102.4° F., and the pulse 110 to 130 per minute. The bladder and bowel actions were normal. She complained of troublesome gas pains and was vomiting most of the fluids given by mouth. There was considerable distension of the upper abdomen necessitating constant duodenal suction drainage for 4 days following operation.

Examination of the abdomen on June 20, showed a firm rounded tender mass filling the abdomen to one inch above the umbilicus. The operative incision was completely healed. Under novocain infiltration, a mid-line incision 1 inch long was made below the umbilicus. On opening the peritoneum there was a flow of a large amount of fecal smelling gas and a few drops of blood. With the release of gas the outline of the abdominal mass was felt to be decreasing considerably. A small rubber tube was inserted for drainage and the incision closed. The discharge of fetid gas through the drainage tube continued for about 10 days. The fluid drainage gradually changed from hæmorrhagic to frankly purulent. Following this the abdominal distension and vomiting stopped and the patient was able to retain a soft diet. On June 26, she complained of pain in her back, right shoulder and lower costal area. She had a chill lasting 10 minutes and the respirations were 30 per minute. The x-ray of the chest showed areas of pneumonitis in the base of both lungs. Both diaphragms were high in position but regular in outline indicating increased intra-abdominal pressure.

Penicillin was given by intramuscular and intravenous routes for the next three days with gradual improvement of her respiratory complaints. She was discharged from the hospital on July 21 with a residual induration in the abdomen reaching halfway to the umbilicus and a scanty purulent discharge from the wound.

The patient was last visited on August 27, when she was in excellent health. The drainage stopped and the wound closed completely. A thin hard mass the size of a silver dollar could still be felt in the left lower quadrant. This was not tender. Her normal menstrual period returned on August 25.

COMMENT

A study of the literature on this subject reveals the fact that the great majority of these cases remain undiagnosed before operation. The chances are that when confronted with such a case the attendant will find it in the nature of a surgical emergency and the operative procedure becomes, therefore, of paramount importance. In 1940, Lyman W. Mason published a statistical review¹ of 69 cases of abdominal pregnancy reported in the English literature from 1933 to 1939, including three of his own cases. Mason gives the following points as being helpful in the diagnosis of abdominal pregnancy.

1. There is usually a history of signs and symptoms of early ectopic pregnancy, with probable tubal abortion. This is the most important diagnostic clue and its

presence should make the attendant conscious of the possibility of abdominal pregnancy.

2. The fetal movements are usually noticeable and painful to the mother.

3. The cervix shows little effacement, is usually high in position and pushed against the symphysis, and there is no dilatation of the internal os.

4. The uterus, somewhat enlarged, is frequently palpable and may then be mistaken for an ovarian cyst or a fibroid obstructing the birth canal.

In regard to treatment Mason stresses two factors as being of great importance in the mortality and morbidity of these cases.

1. No attempt should be made to move the placenta, except in those rare instances where this can be done easily without damage to important structures and without causing uncontrollable hæmorrhage. Three patients have had laparotomies following an abdominal pregnancy in which the placenta was left *in situ* and it had undergone complete reabsorption.

2. The abdomen should be closed without packing or drainage. Drainage of the abdomen with the placenta left *in situ* appears to be the worst treatment of all. Mason's statistics show that there was no recorded death among patients in whom no attempt was made to remove the placenta and in whom the abdomen was closed without drainage. On the other hand, the mortality was highest and the complications most numerous in those patients in whom the placenta was removed, or in whom drainage was employed.

There were some irregular features in the case reported above distorting the clinical picture and obscuring the diagnosis, and only in retrospect was it possible to reconstruct its progress in logical sequence. Obviously, this patient had a tubal abortion during her first hospital period in November, 1944. This was evidenced by the scarred left Fallopian tube and the old blood clots found at operation. But in the absence of vaginal bleeding and the predominance of vomiting the case was mistaken for one of hyperemesis gravidarum and treated as such. For the same reason the possibility of abdominal pregnancy was not suspected at term. In fact, nausea and vomiting were so prominent on both occasions as to focus the attention almost entirely on the toxic features of the case and thus the real cause of her dystocia was only discovered at operation. Had it been possible to leave the placenta *in situ* this patient's recovery would likely have been less critical and complicated. However, with the profuse bleeding following immediately upon opening the membranes there was no choice left for the surgeon but to remove the placenta and cope with the hæmorrhage afterwards. Notwithstanding the wide attachment of the placenta in our case its removal caused only a pinpoint perforation in the intestinal wall leading to the accumulation

of gas in the peritoneal cavity and necessitating incision for drainage 12 days postoperatively.

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**ACUTE VOLVULUS OF THE
GALLBLADDER**

By M. M. Gowland, M.D.

Apia, Western Samoa

The following case gives a picture of an acute volvulus of the gallbladder simulating a perforated peptic ulcer. It is presented as a reminder that this condition be included in the differential diagnosis of an acute abdomen.

The patient, Tina, was a female full-blooded Samoan stating her age as 53 years. She was seen in the native outpatient department on the evening of May 2, complaining of a vague fullness and discomfort in the midepigastrium which had commenced about one hour after her last meal. She had been constipated one day. There was an indefinite history of previous attacks over a period of years, but she could not recall what had given relief. Sippy powder was given and an enema ordered. The patient returned home with instructions to attend the clinic in the morning.

The ambulance brought the patient into hospital, sixteen hours later. She was in shock and complained of a severe pain in the upper abdomen. The enema had had a good result and the powder had given temporary relief. Thirteen hours prior to admission she had experienced a sharp stabbing pain, then slight relief and thereafter a constant pain. This had been accompanied by frequent vomiting and shivering attacks. The pain had moved to the tip of the 9th rib on the right, but had not radiated. Deep breathing was impossible because of the pain, which also prevented her lying on her left side. Temperature 100.8°, pulse 86, respirations 22, blood pressure 112/56.

The patient had an anxious expression, tongue clean but dry, respirations shallow. The heart size and sounds were normal and the

chest was clear. The abdomen showed board-like rigidity throughout and no masses could be palpated. There was neither general or localized distension. Hyperæsthesia to pinprick was discernible from the midepigastrium to the right in the 6th to 9th thoracic segments. A diagnosis of a perforated peptic ulcer into the lesser sac with slow leakage therefore was made.

Intravenous plasma was commenced; 5 c.c. of indigo carmine was given orally to facilitate localization of the perforation. Under general anaesthesia the abdomen was opened through a right oblique gridiron rectus incision. Free fluid was found but no dye appeared. A finger inserted felt a mass about the size of an orange in the region of the liver hilum. The incision was then enlarged into a right subcostal Kocher. A blue-black mass 3" in diameter presented through the incision. It was loosely attached to the liver by a thin mesentery and receded along the gallbladder bed for a distance of 5". The mass was the gallbladder which had rotated clockwise two full turns. Cholecystectomy was performed. The patient made an uneventful recovery, rising on the 3rd day, sutures removed on 8th day. She has been seen each month since and is entirely free of complaints.

The gallbladder was opened, it contained several pure pigment stones. When sectioned, the mucosa was separated from the wall; no excessive fibrosis was present, nor was there any actual perforation.

While volvulus is rare it is even more unusual for it to occur in the presence of calculous cholecystitis.

Apia, Western Samoa.

**TULARÆMIA — A PROBLEM IN
DIAGNOSIS***

By Ewen A. Mackenzie, M.D.

Iroquois Falls, Ont.

The patient, Mrs. M.M., aged 60, was admitted to hospital as a characteristic case of acute diffuse bronchopneumonia. She presented the appearance of an asthenic and run-down individual, acutely and seriously ill. She was markedly dyspnoic, moderately cyanosed and complained of pain in her right chest. Mouth temperature was 102, pulse 104, respirations 28. The most striking findings on physical examination were

* From the Case Records of the Anson General Hospital, Iroquois Falls, Ontario.

the scattered patches of fine moist râles throughout both lungs but particularly the right. Slight lower abdominal tenderness was noted at this time. The patient was placed on a pneumonia routine with sulfathiazole tab. iv stat and tab. ii q. 4 h.

During the next two days the patient had a fairly productive cough with apparently typical rusty sputum. Her temperature, however, did not respond satisfactorily, rising daily to 102, and she was not improving clinically. On the evening of the second day she had a small dark foul-smelling movement and on the third day copious diarrhoea containing both tarry material and also frank blood.

At this point a diagnosis of typhoid fever was considered and a Widal test was done, with negative results. A suitable routine was instituted with high calorie low residue diet and tepid spongings for excessive pyrexia. Aspirin gr. x q. 4 h. was substituted for the sulfathiazole. Re-examination revealed no abdominal rose spots, the spleen was not palpable and the usual bradycardia was absent; the pulse rate paralleled the temperature exactly.

A chance recollection of the observation "tularemia owing to its rarity is frequently misdiagnosed typhoid or pneumonia" gave the final clue to a correct diagnosis.

Any contact with wild rabbits was stoutly denied but as an after-thought the patient observed that she had 200 tame ones or rather had had 200 tame ones at home before some sickness or other had almost wiped them out. Further questioning revealed that rabbit meat had been their staple article of diet for almost two months and whereas she killed and cleaned them, her husband handled them only in the cooked state and remained well. The cat, however, was not so fortunate, a meal of raw rabbit having resulted in a brief and fatal illness.

The agglutination test was reported positive 1/200 for *P. tularensis*. The patient was left on the typhoid routine with symptomatic therapy. She showed a swinging daily temperature, rising some days to 104.3° and gradually subsiding over a two week period by lysis. She was discharged on the 18th day. No recurrence of signs or symptoms have been noted in over a year's follow-up.

DISCUSSION

In approximately 85% of cases of tularemia the portal of entry can be identified. These comprise the ulcero-glandular and the less common conjunctivo-glandular types. Typically the primary lesion is found on the hands or fingers. It takes the form of an indolent shallow ulcer covered with a greyish membrane. The organism proceeds rapidly from the primary sore via the lymphatics to the regional lymph glands which become enlarged and very tender. Systemic signs may be severe with chills, prostration, generalized pains, malaise and headache. In the oculo-glandular type the organism is inoculated by rubbing into the conjunctival sac whence it spreads to the regional glands.

Of the remaining 15% with no obvious portal of entry, some cases present a marked generalized adenopathy—the so-called glandular type which must be differentiated from other causes of generalized adenopathy.

Finally comes the so-called typhoid group to which the case reported belongs. This form is

typically seen in laboratory workers. The exact mode of inoculation is unknown. Ingestion, inhalation and inoculation through the unbroken skin have all been suggested.

No evidence of a primary focus nor history of one was obtained in this case, nor were there any palpable lymph glands. The skin or lungs seem the probable portal of entry since the husband was not affected.

PARTIAL TRANSPOSITION OF THE UPPER ABDOMINAL VISCERA

By A. P. Guttman, M.D. and
I. Maclaren Thompson, M.B.

Winnipeg

Apart from extensive visceral transposition, dextrogastrica seems to be exceedingly rare. Kinney¹ refers to two cases recorded by Paillard in 1903, and Griffin reported one case in 1912, quoted by Kinney.¹ In 1920 Brash and Stewart² described a case of transposition of the stomach, duodenum, spleen and pancreas, and in 1941 a somewhat similar case was described by Bellamy.³ Apart from these cases, the Surgeon General's Index Catalogue and the Quarterly Cumulative Index Medicus for the last forty years list no title specifying such a condition.

The case now reported is that of a young man, 27 years of age, who saw me on November 24, 1944, and gave a clinical history of duodenal ulcer of 8 years' duration. A barium series was done on December 1; the following abnormalities were evident and are shown in Figs. 1, 2 and 3. The stomach is transposed to the right side of the abdomen; it is regular in outline and freely movable. The duodenum is transposed to the left, and the cap is deformed. The colon is in the normal position, with the exception of the descending colon which is nearer the median plane than usual. The position of the colon is confirmed by the barium enema. A gall bladder examination showed the gall bladder to be well visualized, functioning normally, and lying low on the left side below the crest of the ilium (Fig. 3). The liver appears to be on the left side, and tail of the pancreas and the spleen are presumably on the right side. Fluoroscopy and the chest plates showed the heart in normal position.



COMMENT⁴

[Professor I. Maclaren Thompson, Professor of Anatomy, University of Manitoba.]

Transposition of the stomach and duodenum are clearly shown in the x-ray films. The barium enema shows the descending colon nearer the median plane than normal. In the absence of evidence one way or the other, it is reasonable to suppose that the spleen is transposed with the stomach and the pancreas with the duodenum. The cholecystogram shows the gall bladder below the iliac crest on the left side. Comparison of the cholecystogram with the film showing the duodenum indicates that the gall bladder is related to the transposed duodenum as might be expected if the liver were also transposed. On the other hand, the right lobe of an otherwise normal liver, carrying with it the gall bladder, might be crowded over to the left by the transposed stomach and spleen so as to bring the gall bladder into the position shown in the cholecystogram. Therefore we cannot, on this evidence, be certain whether the liver is really transposed or is merely displaced; we must therefore assume one or the other; displacement seems to be the more conservative assumption, and I think has been observed in the majority of such cases subjected to detailed anatomical examination. The position of the descending colon nearer the median plane than normally suggests deficient fixation of the descending colon, with a persistent descending mesocolon of unknown extent; this is a simple arrest of development.

The transposition is probably attributable to reversal of the first stage of rotation of the mid-gut loop, the pre-arterial limb swinging to the left instead of to the right, thereby causing the duodenal loop to rotate to the left instead of

to the right, presumably carrying the pancreas with it.

The duodenal loop probably dragged the pylorus to the left (instead of to the right), leading to reversed rotation of the stomach, the dorsal border (greater curvature) swinging to the right (instead of to the left), presumably carrying the spleen with it.

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100 Charles St.

A MALFORMATION OF THE SYMMELIA TYPE

By R. V. Chapple, B.A., M.D.

Sudbury, Ontario

Mrs. K., aged 27, was first seen on July 15, 1940, complaining of amenorrhœa since March 6, 1940. Vomiting and nausea were present to a mild degree during the first twelve weeks. The breasts had enlarged considerably.

Previous history. — Essentially negative. Periods had commenced at 12 years of age and recurred on a twenty-eight day interval lasting one to three days. Dysmenorrhœa was present; no previous pregnancies or abortions had occurred.

Family history. — One brother has a congenital shortening of the right arm with malformation of the hand and fingers.

Obstetrical progress. — The patient was seen on three occasions until October 16. Exam-

the scattered patches of fine moist râles throughout both lungs but particularly the right. Slight lower abdominal tenderness was noted at this time. The patient was placed on a pneumonia routine with sulfathiazole tab. iv stat and tab. ii q. 4 h.

During the next two days the patient had a fairly productive cough with apparently typical rusty sputum. Her temperature, however, did not respond satisfactorily, rising daily to 102, and she was not improving clinically. On the evening of the second day she had a small dark foul-smelling movement and on the third day copious diarrhoea containing both tarry material and also frank blood.

At this point a diagnosis of typhoid fever was considered and a Widal test was done, with negative results. A suitable routine was instituted with high calorie low residue diet and tepid spongings for excessive pyrexia. Aspirin gr. x q. 4 h. was substituted for the sulfathiazole. Re-examination revealed no abdominal rose spots, the spleen was not palpable and the usual bradycardia was absent; the pulse rate paralleled the temperature exactly.

A chance recollection of the observation "tularemia owing to its rarity is frequently misdiagnosed typhoid or pneumonia" gave the final clue to a correct diagnosis.

Any contact with wild rabbits was stoutly denied but as an after-thought the patient observed that she had 200 tame ones or rather had had 200 tame ones at home before some sickness or other had almost wiped them out. Further questioning revealed that rabbit meat had been their staple article of diet for almost two months and whereas she killed and cleaned them, her husband handled them only in the cooked state and remained well. The cat, however, was not so fortunate, a meal of raw rabbit having resulted in a brief and fatal illness.

The agglutination test was reported positive 1/200 for *P. tularensis*. The patient was left on the typhoid routine with symptomatic therapy. She showed a swinging daily temperature, rising some days to 104.3° and gradually subsiding over a two week period by lysis. She was discharged on the 18th day. No recurrence of signs or symptoms have been noted in over a year's follow-up.

DISCUSSION

In approximately 85% of cases of tularemia the portal of entry can be identified. These comprise the ulcero-glandular and the less common conjunctivo-glandular types. Typically the primary lesion is found on the hands or fingers. It takes the form of an indolent shallow ulcer covered with a greyish membrane. The organism proceeds rapidly from the primary sore via the lymphatics to the regional lymph glands which become enlarged and very tender. Systemic signs may be severe with chills, prostration, generalized pains, malaise and headache. In the oculo-glandular type the organism is inoculated by rubbing into the conjunctival sac whence it spreads to the regional glands.

Of the remaining 15% with no obvious portal of entry, some cases present a marked generalized adenopathy—the so-called glandular type which must be differentiated from other causes of generalized adenopathy.

Finally comes the so-called typhoid group to which the case reported belongs. This form is

typically seen in laboratory workers. The exact mode of inoculation is unknown. Ingestion, inhalation and inoculation through the unbroken skin have all been suggested.

No evidence of a primary focus nor history of one was obtained in this case, nor were there any palpable lymph glands. The skin or lungs seem the probable portal of entry since the husband was not affected.

PARTIAL TRANSPOSITION OF THE UPPER ABDOMINAL VISCERA

By A. P. Guttman, M.D. and
I. Maclaren Thompson, M.B.

Winnipeg

Apart from extensive visceral transposition, dextrogastric seems to be exceedingly rare. Kinney¹ refers to two cases recorded by Paillard in 1903, and Griffin reported one case in 1912, quoted by Kinney.¹ In 1920 Brash and Stewart² described a case of transposition of the stomach, duodenum, spleen and pancreas, and in 1941 a somewhat similar case was described by Bellamy.³ Apart from these cases, the Surgeon General's Index Catalogue and the Quarterly Cumulative Index Medicus for the last forty years list no title specifying such a condition.

The case now reported is that of a young man, 27 years of age, who saw me on November 24, 1944, and gave a clinical history of duodenal ulcer of 8 years' duration. A barium series was done on December 1; the following abnormalities were evident and are shown in Figs. 1, 2 and 3. The stomach is transposed to the right side of the abdomen; it is regular in outline and freely movable. The duodenum is transposed to the left, and the cap is deformed. The colon is in the normal position, with the exception of the descending colon which is nearer the median plane than usual. The position of the colon is confirmed by the barium enema. A gall bladder examination showed the gall bladder to be well visualized, functioning normally, and lying low on the left side below the crest of the ilium (Fig. 3). The liver appears to be on the left side, and tail of the pancreas and the spleen are presumably on the right side. Fluoroscopy and the chest plates showed the heart in normal position.



COMMENT⁴

[Professor I. Maclaren Thompson, Professor of Anatomy, University of Manitoba.]

Transposition of the stomach and duodenum are clearly shown in the x-ray films. The barium enema shows the descending colon nearer the median plane than normal. In the absence of evidence one way or the other, it is reasonable to suppose that the spleen is transposed with the stomach and the pancreas with the duodenum. The cholecystogram shows the gall bladder below the iliac crest on the left side. Comparison of the cholecystogram with the film showing the duodenum indicates that the gall bladder is related to the transposed duodenum as might be expected if the liver were also transposed. On the other hand, the right lobe of an otherwise normal liver, carrying with it the gall bladder, might be crowded over to the left by the transposed stomach and spleen so as to bring the gall bladder into the position shown in the cholecystogram. Therefore we cannot, on this evidence, be certain whether the liver is really transposed or is merely displaced; we must therefore assume one or the other; displacement seems to be the more conservative assumption, and I think has been observed in the majority of such cases subjected to detailed anatomical examination. The position of the descending colon nearer the median plane than normally suggests deficient fixation of the descending colon, with a persistent descending mesocolon of unknown extent; this is a simple arrest of development.

The transposition is probably attributable to reversal of the first stage of rotation of the mid-gut loop, the pre-arterial limb swinging to the left instead of to the right, thereby causing the duodenal loop to rotate to the left instead of

to the right, presumably carrying the pancreas with it.

The duodenal loop probably dragged the pylorus to the left (instead of to the right), leading to reversed rotation of the stomach, the dorsal border (greater curvature) swinging to the right (instead of to the left), presumably carrying the spleen with it.

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Family history. — One brother has a congenital shortening of the right arm with malformation of the hand and fingers.

Obstetrical progress. — The patient was seen on three occasions until October 16. Exam-

inations and findings were essentially negative. Weight increase fifteen pounds. Size of abdomen corresponded with stated amenorrhœa. Fetal parts were not definitely differentiated. Fetal heart could be heard in right lower quadrant.

On October 26, at 8.40 p.m. the patient was admitted to hospital having regular contractions at ten minute intervals with slight show. She was prepared for a premature delivery. Rectal examination at 11.00 p.m. revealed a

heavy cervix to be about three fingers dilated. The presenting part could not be definitely stated. Labour progressed normally. Heroin was used as a sedative.

At 4.00 a.m., October 27, labour had progressed to the point where the presenting part would dilate the introitus about one inch. Examination revealed an oedematous mass (scrotum-like) to the left, with an aperature more posterior. On further examination neither of these structures appeared normal. Further



examination revealed some type of abnormality of the extremities as they could not be separated. At this time it was decided that we were dealing with some type of monstrosity. The patient was given a general anæsthetic with ether. The finger was hooked into the groin angle and the buttocks and the body easily delivered. The arms were delivered by rotation followed immediately by the head. The fetus survived a few minutes only. The placenta was delivered normally thirty minutes later. There were no post partum complications.

Various abnormalities were present in the fetus. The weight was four pounds, ten ounces. Total length fifteen inches. The head, neck, chest, abdomen, and spine appeared normal.

Right upper extremity.—The upper arm was normal. The forearm was very much shortened, with considerable external bowing. The hand and fingers were normal. The right thumb was absent.

Left upper extremity was essentially similar to its fellow arm, with the thumb being present. The lower arm and hand gave a fin-like impression.

Lower extremities.—These were fused from the perineal region to the heels. The feet were separated in a V-shape, with the plantar surfaces almost facing each other. The fusion appeared to be of the skin and subcuticular tissues with a thickness of approximately one-half inch. Muscular tissue could be felt on each limb. The lower limbs could not be flexed together. However the left lower limb could be flexed to a small degree while the right knee could be hyperextended but not flexed. Ankle movements appeared normal as much as the fusion would allow. The lower extremities were acutely flexed on the abdomen. Any effort to straighten the lower limbs caused a forward curvature of the lumbar spine.

Urogenital.—There was no sex factor present. A cloaca-like aperture was present at the base of the spine in the usual anal location. The muco-cutaneous junction was of serrated nature and did not present the usual sphincter-like appearance. No evidence of sphincter muscles was present. Immediately anterior to the cloaca was a soft mass of tissue covered with skin on the lateral and anterior surfaces. The posterior surface had a mucous lining terminating at the edge of the cloaca. This can be located in Fig. 2. In Fig. 3 the location of this tissue is marked by pencil protruding from the cloaca.

A flat x-ray plate was taken of the whole fetus in the antero-posterior direction; the report was as follows: "Both upper extremities show a complete failure of development of the radius. The ulnæ are shorter than normal and show well marked bowing. On the right side the thumb metacarpal and its phalanges are absent. The lower extremities show normal osseous development. The pelvis, on the right side, shows absence of pubic bone. Rotation of the tibia and fibula is apparently present on either side."

COMMENT

A malformation of one of the rarer types is presented. This type of case comes under the general classification, "symmelia" or "sympodia" the latter probably being the more accurate of the two descriptions in this case, since symmelia refers merely to the fusion of limbs which may be upper or lower; whilst the fusion of the lower limbs is only met with in cases of double terata. See Birnbaum and Blacker's "Malformations of the Fetus" page 268 (Macmillan and Company, Toronto, 1912).

The mother has had three normal full term deliveries since the birth of this abnormality.

CLINICAL and LABORATORY NOTES

CERVICAL CYTOLOGY TESTS IN CANCER DIAGNOSIS: GLYCERINE TECHNIQUE FOR MAILING*

By J. Ernest Ayre, M.D. and Evelyn Dakin

Montreal

The vaginal and cervical cytology smear is a relatively recent development in uterine cancer diagnosis. It is rapidly becoming established as a reliable and simple method of making a presumptive diagnosis of malignancy arising from the uterus. The original technique of preparing the smears was outlined clearly by Papanicolaou and Traut.¹ In the past five years various investigators (Meigs,² Ayre³) have reported large series of cases in confirmation of Papanicolaou's⁴ excellent work, in which the cytology diagnosis showed less than a 10% deviation from the pathological diagnosis.

* From the Gynecytology Laboratory, Department of Obstetrics and Gynecology, Royal Victoria Hospital, McGill University, Montreal.

This technique described is part of a paper presented at the South Atlantic Association of Gynecologists and Obstetricians at Greensboro, North Carolina, February 15 and 16, 1946.

Papanicolaou and Traut advised taking the smear with a pipette, spreading it on a clean dry slide which was promptly immersed in a solution of equal parts of 95% alcohol and ether, and the slides were kept moist in this same solution until they were stained and mounted for interpretation. This method of fixation is quite satisfactory for hospital use where the smear is taken in the wards and then sent to the cytology laboratory adjacent, for staining and interpretation. However, when the smears are taken in an office or at any point distant from the laboratory, transportation becomes a technical problem. Bottles large enough to carry the glass slides immersed in the alcohol and ether mixture are bulky and can not readily be mailed. This difficulty has greatly limited the scope of adaptability of the smear method to general use.

Until recently it was our practice to follow this same technique, carrying the bulky bottles back and forth between office and laboratory. In an effort to evolve a technique where the cytological material could be transported by mail, the centrifuge⁵ technique was worked out in our laboratory. This method consisted in aspirating the secretions from the cervix and expressing them into a test tube containing a fixative (formalin, or ether and alcohol) the test tube

being mailed in a container similar to that used for Wassermann tubes. Arriving in the laboratory the cellular material was first centrifuged and then mounted in a paraffin block and sectioned similar to any tissue biopsy. This technique is particularly adaptable where the available equipment is that of a pathological laboratory. This test will tell if well-established cancer is present, but it fails to preserve the more delicate morphological and staining signs which we are beginning to recognize as pre-cancerous.

More recently we have found that it is not necessary to leave the cytology smears immersed in the fixative solution until they are stained. Dry smears were studied but were found too variable in cell definition. To preserve nuclear definition adequately to permit consistent accuracy in cancer diagnosis we have developed a new but simple technique which will permit mailing of the slides. The slides are first fixed in the usual fashion, then are removed from the fixative and a drop of glycerine is placed over the smear area, then a second slide applied to the face of the smear. As the glycerine spreads between the two slides it effectively seals over the smear, preserving the moist ether-alcohol environment of the

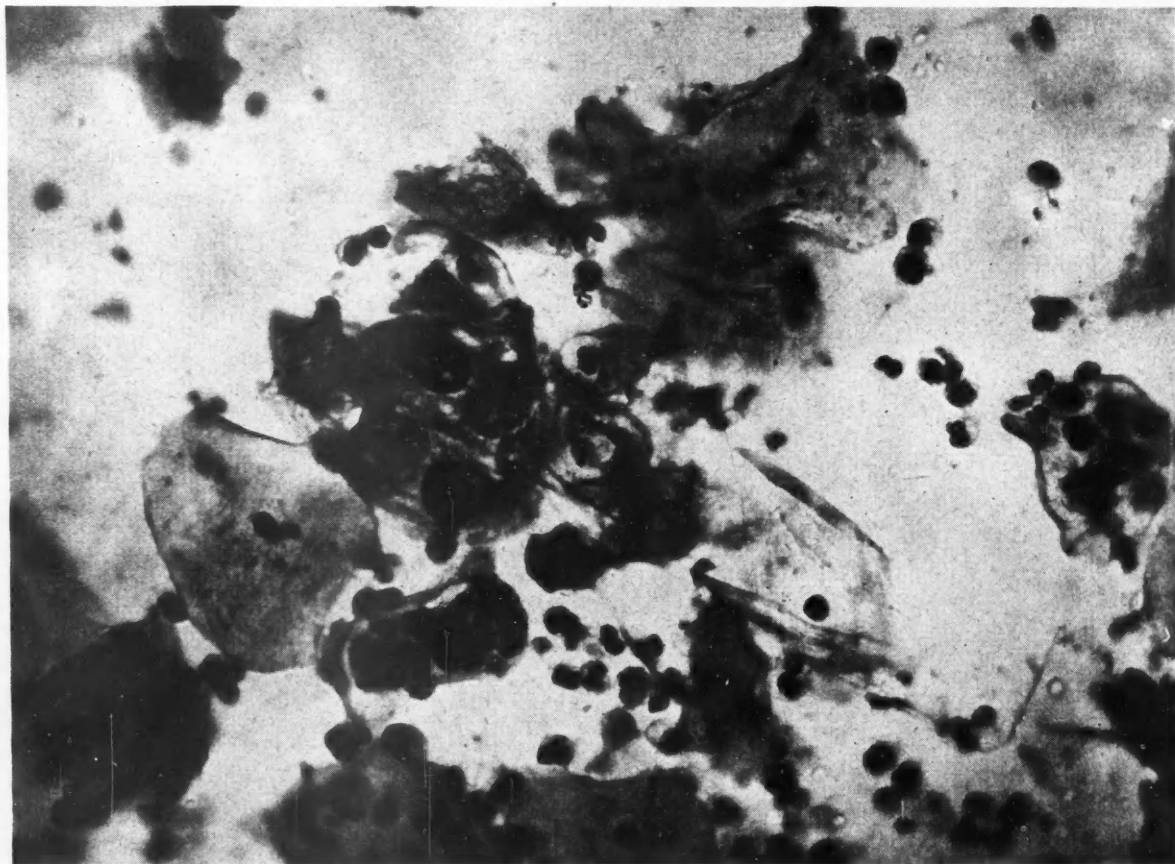


Fig. 1.—Cervical cytology smear (glycerine technique) in case of squamous carcinoma of cervix. These slides were mailed in an envelope, remaining out of solution for eight days prior to staining! Observe perfect preservation of detail of cancer cells and normal cornified elements. This is important, as recognition of abnormally high cornification (endogenous oestrogen) is a new diagnostic criterion in uterine cancer.

smear zone. An elastic placed around the slides holds them together, and they may be placed in a tiny wooden container and mailed to the laboratory for staining.

INSTRUCTIONS FOR GLYCERINE TECHNIQUE

1. *Taking the test.*—The cervical cytology test is taken when the patient is first examined gynaecologically. Preceding bimanual examination a bi-valve speculum is inserted into the vagina without any lubricant, except possibly a small quantity applied just at the introitus. Too much of the lubricant may cause interference with the staining reaction. Following adequate exposure of the cervix, a glass pipette is used to aspirate the secretions from the external cervical os. These are transferred to one or two glass slides. The secretion is spread out over a three-quarter inch diameter area at one end of the slide. The smear should not be too thick nor too thin. As there is frequently a thick blob of mucus in the cervix, this is spread out over the slide so that the peripheral parts of the smear will be thin. Although this tenacious mucus is somewhat difficult to handle, its preservation is important as it frequently holds the exfoliated endometrial or cervical cells. Following preparation of the smear or spread, it is immediately immersed in the solution containing equal parts of 95% alcohol and ether. The slides are then left immersed in this solution for one hour.

2. *Mounting with glycerine.*—The smears may be temporarily mounted with glycerine to facilitate mailing. This is done as follows:

After standing in a fixative for one hour the slides are removed by the office or clinic technician, and without permitting drying, a large drop of glycerine is placed in the centre of the secretion zone. A second glass slide is placed face to face with the smear and the glycerine spreads out to cover the entire smear area, sealing it off completely. The two slides are then placed in a tiny wooden container in which form mailing is facilitated. The slides may remain in the temporary glycerine mounting up to two weeks if necessary, but the best staining results will be obtained if this does not exceed one week. This permits ample time for mailing to any laboratory on the continent.

3. *Staining procedure.*—This is carried out in the cytology laboratory. The cover slide is removed by rotating one slide on the other slightly preceding separation. The slide containing the cell smear is then placed in absolute alcohol for five minutes to allow the glycerine to dissolve, then staining as follows:

1. Wash in 70 then 50% alcohols, then rinse well in two changes of distilled water.

2. Stain in Harris haematoxylin for six to ten minutes, depending on condition of stain; older stain requires more time. Solution should be changed regularly every two weeks.

3. Rinse thoroughly three to four times in 0.5% aqueous solution HCl.

4. Rinse thoroughly in running tap water (cold) ten to fifteen minutes. If time is not a factor, fifteen to twenty minutes is more satisfactory.

5. Rinse in 50%, 70%, 80%, and two changes of 95% alcohol (do not carry any water into OG-6).

6. Stain for one minute in OG-6, depending on age of stain.

7. Rinse five to ten times in each of two jars containing absolute alcohol (95%) to remove excess stain.

8. Stain in EA-50 two and one-half to three and one-half minutes.

9. Rinse five to ten times in each of three jars containing 95% alcohol. (Fresh alcohols—not ones used after OG-6.)

10. Rinse in absolute alcohol.

11. Rinse in zylol (1) and (2), allowing to stand a couple of minutes in second zylol before mounting.

12. Mount in Canada balsam or permount.

N.B.—It is very important that water does not come in contact with slides after No. 5.

Have separate bottle for each step—do not use the 70 and 50% alcohols set up for No. 2 when coming to No. 5. The same applies to other repeated solutions.

The stain which we have found most efficacious in preserving cell detail in this technique is Papanicolaou's EA-50 and OG-6.

From an experimental study of ten cancer cases, using this glycerine technique, we have been unable to detect any loss of cellular definition or detail after one to seven days. Both cancer cells and normal cornified elements retain their original morphology and staining reaction. This fact is significant, as we have recently come to recognize that the degree of cornification is an important diagnostic sign,⁶ not only in full-blown cancer but more significantly in a precancerous cervical lesion.

This development means that the smear test as a method of determining early uterine cancer diagnosis is adaptable in any location. It means that smears may be taken and transported by mail in the same manner as tissue biopsy slides are mailed.

SUMMARY

A new cytology technique has been described whereby vaginal and cervical smears may be temporarily mounted for mailing by the described glycerine technique. The cancer cells and normal cells lose none of their morphological interpretation of cancer or pre-cancer.

The cytology test for cancer becomes as readily available to the physician's use as a Wassermann test.

This investigation was aided by a grant from the Ortho Research Foundation.

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AN IMPROVED METHOD OF ARTHROGRAPHY

By A. Blaustein, M.D., C.M.

Montreal

It is well known that clinical symptoms and signs have never been replaced by laboratory and radiographic methods in ultimately determining the procedure one is to take in treating a case, but that they are valuable aids one cannot deny; and the arthrogram is one of these. A well taken arthrogram can tell the extent radiologically of an injury to the menisci.

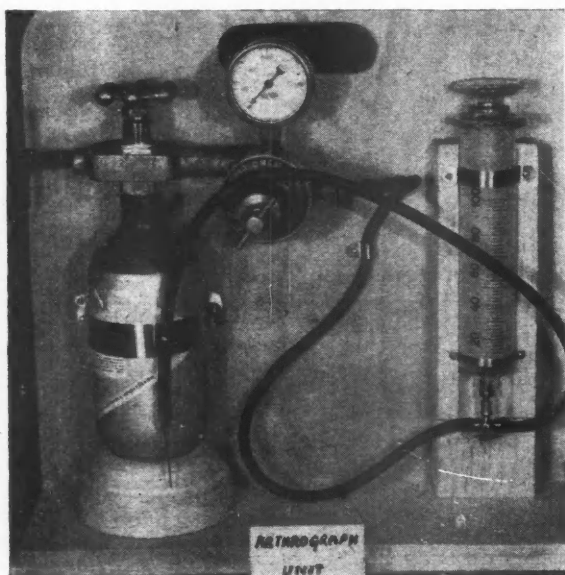
Having seen arthrograms done in various ways I became interested in devising a simple

apparatus that would deliver a controlled, measured amount of filtered pure oxygen into the knee joint. This consists of the use of a miniature oxygen tank with an airflow control gauge attached, a 100 c.c. syringe and 3-way stopcock, a glass filter and some rubber tubing.

One turns on the oxygen tank till the pressure is registered. It is then shut off and the airflow is turned on slowly and the flow in the stopcock directed upwards in the syringe. The oxygen flows into the syringe and the plunger rises to the desired amount of oxygen measured in cubic centimetres.

The flow is then directed towards the needle and the plunger comes down, forcing the oxygen into the joint cavity.

The apparatus is easily assembled on a portable wooden stand as shown in the illustration.

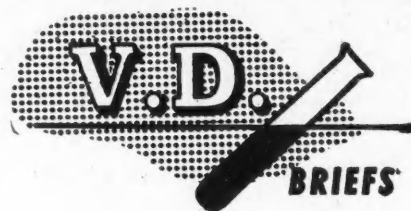


TECHNIQUE

Sterile precautions should be taken, as one always does with knee joint procedures. The knee should be prepared with green soap, ether, alcohol and metaphen, and then draped. The operator should cleanse his hands and wear rubber gloves. The syringe, needle, and the rubber tubing leading from the syringe should be sterilized. A No. 16 or No. 18 aspirating needle should be used. One has been modified to fit the contour of the knee joint, and it has several advantages: (a) the operator need not hold it; (b) the needle is prevented from going in unduly far.

X-ray procedure.—(1) Antero-posterior and lateral film. (2) An antero-posterior over a curved cassette with the knee flexed 30 degrees. (3) Spot films on either side of the patella.

VENEREAL DISEASE CAMPAIGN



Influence on Social Conduct Required if VD to be Eradicated

Despite success attained by the anti-VD educational program of the Medical Section of the R.C.A.F. during the war, authors of an article in a recent issue of the *Canadian Journal of Public Health* "fear little impression has been made upon the great social problem which lies behind venereal disease".

The article is entitled "Some observations on venereal-disease control in the Royal Canadian Air Force". Air Commodore J. W. Tice, Wing Commander A. H. Sellers, Squadron Leader R. M. Anderson, and Flight Sergeant W. Nichols, collaborated in its preparation.

The educational program was probably worth the effort put into it, the article comments, "because the responsibility of the Medical Branch has been to prevent as many infections as possible, and when infection occurred to get patients under treatment as quickly as possible".

The article goes on to state, however, that venereal-disease education alone is not enough.

"If the underlying problem is to be solved, an influence must be directed toward the social conduct of great numbers of people, long before venereal-disease education is indicated. Those people who shape the characters of our youths—the parents, the teachers, and the clergy—are the ones upon whom this responsibility rests."

In offering "the one great practical object lesson in venereal-disease control for public health in the future", the article suggests that active venereal-disease case-finding programs on the part of all civilian health departments offer the best assurance of progressive success in any national venereal-disease control effort."

It is stated that as in any other communicable disease against which specific immunization is not possible, satisfactory control depends in very large measure on controlling the sources of infection.

"Find V.D. Contacts — Report V.D. Cases"

THE CANADIAN MEDICAL ASSOCIATION

Editorial Offices—3640 University Street, Montreal

(Information regarding contributions and advertising will be found on the second page following the reading material.)

EDITORIAL

THE CONTROL OF STREPTOMYCIN

THE advent of antibodies has been accompanied by features not present in the case of any other therapeutic substance in history. Ordinarily the course of events has been that a new remedy has had to make its way by degrees, its production keeping pace, or nearly so, with the demand.

In the case of penicillin, however, the dramatically convincing effects could not be at once implemented by adequate supplies. This was further complicated by overruling military demands. Consequently rigid control and rationing was essential. Gradually, of course production gained the upper hand and penicillin became freely available.

Now we have the same kind of situation in the case of streptomycin. This antibiotic promises to account for at least some of the organisms which do not yield to penicillin, notably the Gram-negative group; and it may even be of value in tuberculosis.

This has led to immediate and insistent demands for the substance. But there is the same lag in its production as there was in the case of penicillin; not quite perhaps, since we have the advantage of later improved methods of growth and extraction, but still production is far behind demand. Incidentally, it may be remarked that streptomycin can be produced in almost absolutely pure form, so much so that it may soon be possible to prescribe it by the gram, whilst penicillin at best still suffers from a large proportion of accompanying impurities.

The situation calls for some control of the available supply of streptomycin, and this has been put into force by the National Research Council. The difficulty in allotting it is only appreciated by those who have that duty. With the best intentions in the world it happens that physicians will appeal for supplies to treat cases which should not have priority. This may result in one case

alone using up all the available local supply and yet after more careful study it may turn out that streptomycin should not have been used at all. It is thus of more than academic importance that an accurate bacteriological diagnosis should be made, and even when streptomycin becomes a corner drug store stock in trade its indiscriminate use must still be deplored even as in the case of sulfonamides and penicillin. We know now that organisms may develop resistance to both of these by small repeated doses and the same thing is being found to be true of streptomycin.

EDITORIAL COMMENTS

Maternal and Infant Mortality in Canada

The Dominion Bureau of Statistics has prepared a study of maternal, infant and neo-natal mortality in Canada which contains a mass of interesting material.* It covers the period 1926 to 1940, with separate additional statistics for the years 1941, 1942 and 1943.

Birth rates from 1926 to 1937 showed a gradual drop of 20% from 24.8 to 19.8 per 1,000. From 1938 to 1943 there was a slow increase which brought the rate nearly back to the 1926 level. Birth and marriage rates did not always parallel each other. From 1934 to 1937 the birth rate declined steadily, although the marriage rate increased.

There has been a marked and gratifying decrease in maternal mortality since 1931, the rate for 1943 reaching the figure of 2.8, as against 4 for 1940. This is attributed to several factors, such as educational efforts (especially the Maternal Mortality Survey of 1926 and 1927); the increase in prenatal services; more and better hospital facilities; and improved obstetrical technique. At the same time it is to be realized that there is a considerable range in the mortality rates between Provinces and larger centres. This varies from as low as 1.0 per 1,000 to as high as 5.9. There is still much room for improvement.

As regards causes of death, it is shown that on the whole the three main causes were sepsis, toxæmias of pregnancy and puerperal hæmorrhage: all conditions susceptible to control. It was rather curious that there was a sudden sharp rise in the mortality from sepsis in 1936, about the time that the sulfonamides first

* A Study in Maternal, Infant and Neo-Natal Mortality: published by authority of Hon. James A. MacKinnon, M.P., Minister of Trade and Commerce, Ottawa. Price 25c.

began to be generally used; on the other hand, the mortality fell steadily from that year on. The rates of mortality from hæmorrhage have shown an unsatisfactory steadiness since 1931. The Manitoba Pregnancy Survey showed that transfusions were used in too few cases, and the need for blood banks is strongly emphasized. Other studies have tended to show that good nutrition in the prenatal period tends to reduce the incidence of hæmorrhage. Toxæmias of pregnancy also have been thought to depend to some extent on poor nutrition, as they also showed a rise in incidence between 1932 and 1936 when the economic depression was at its worst. The peak was reached in 1936 but there has been a gratifying diminution since then.

The figures for phlegmasia alba dolens, embolism and sudden death bear no apparent relation to those for sepsis, for whereas there was in the case of sepsis a tendency to decrease since 1935-1936, the rate in the case of the vascular complications rose steadily till 1940. There was then a definite drop in the succeeding year till 1943.

Infant mortality has shown the most constant and gratifying decrease since 1926, with the exception of some rise in 1937. The total reduction has been more than 45.1%. But even with this sharp fall in the figures there is need for greater efforts to control this mortality. The rate in Canada is still higher than that in several other countries, notably Sweden, New Zealand, Switzerland and the United States. Furthermore there is, just as in the case of sepsis, far too great a range between the mortality from this cause in the Provinces and large centres; the range being as great as from 80 to 38 in the Provinces and in the larger cities from 97 to 24.

"Tracers" For Medical Research

It has been announced previously that a committee was formed to advise the President of the National Research Council on the medical aspects of research into atomic energy. This committee has formed a sub-committee under the chairmanship of Dr. J. B. Collip to deal with the use of "tracers" in medical and biological research. The function of the Tracer Sub-Committee is to assist research organizations in Canada in using isotopes for specifically stated and approved researches in medicine and biology. It is expected that some materials may become available toward the end of 1946. Requests for information concerning isotopes or counting apparatus should be addressed to the Secretary, Dr. G. C. Butler, National Research Council, P.O. Box 159, Station "H", Montreal, Que.

MEDICAL ECONOMICS

GOVERNMENT DOMINATED MEDICINE*

By Frank H. Lahey, M.D.

Boston, Mass.

First of all, I would like to say this, that our approach to the problem up to now has been most unfortunate. I have just been to the Southern Surgical Society where there was a rather hot discussion concerning a method of operating. In the discussion, I said it reminded me of what Robert Moses said in New York, which was very apt. He said, "Now we have an excellent controversial subject, and we can choose up sides and have a contest". That is about what we have done with state medicine. There have been too many epithets, there has been too much heat and not enough light, and we could go on endlessly, and the reason I say that is that it is too important a subject to everybody in and out of medicine to get hot over. It is too important a subject, not for you and me; it is not so important in terms of what our practice will be. That is the wrong approach. It is important in terms of what medicine would be in the future under government and that is the point of view from which I would like to approach this subject. I have the greatest respect for the opinion of any advocate of any form of state medicine. We must respect and consider every point of view in this matter, otherwise how can we expect others to respect ours?

I would personally like to say that prepaid medicine deserves a place in this country; it should come and must come, for if that is not valuable, then life insurance is not. It is distinctly a method of distributing the load which you and I know is heavy. But there are certain things about any form of prepaid medicine which I think must be true if it is to be sound and if it is not, we get with it not only the good but some of the very undesirable bad. We must outstandingly, I believe, have a free choice of doctors. We must outstandingly, I believe, have an upper limit of income to which this plan is applicable. We must have oversight of the agencies which insure that your investment in it and my investment in it may not be squandered and is sound. In my opinion, it should be voluntary and not compulsory if it is to endure at a proper level of quality. We have had some very honest

* Some extemporaneous remarks on the subject in response to a request to discuss it after a clinical lecture before the Medical Society of the District of Columbia, on January 16, 1946. Also read after editing of the discussion at a meeting of the Los Angeles Surgical Society on March 18, 1946. Also read at Sectional Meeting of American College of Surgeons, Montreal, Canada, on March 22, 1946.

experiences with the insurance plans with which people who are familiar with them are aware, in which too much has been offered. Note the early experience of Michigan. The insurer in these early experiences has run into tremendous deficits. It is true that these have been met and taken care of, but those are the things we must avoid. We must not offer more than we can supply either in quantity or quality.

Why must we have an upper limit of income? In order that there will remain a contract between a sufficient number of people and doctors so that free enterprise, free effort, competition, quality competition and all the other things that go with what has made this country what it is are retained in sufficient numbers so that the quality of medicine will not depreciate. Why must we not have government dominated medicine? I have repeatedly said that medicine is at a very high level in this country, the highest in the world today; I know from having seen world medicine that now the war is over, the world will come to America largely for its postgraduate education. As we went to Germany in our time, so will they come to us because inevitably they must. We have the facilities, we have the men, we have the institutions and we have the material in quantity. I have never understood why we must do the things which can in any way destroy this. And what will destroy it? The abolition of one single factor—quality competition. The thing that has made medicine what it is today is quality competition. It is not price competition, it never has been price competition which has made medicine what it is. It is quality competition in surgery, in medicine, in research, in medical literature, in any part of medicine.

The thing I fear is that under government dominance, no matter how well intentionally paternalistic it may aim to be, quality competition will depreciate. I have lived in government during this war and I have seen very limited evidences of quality competition in it. I do not say this critically: I say it because I do not see how it can occur. As an example, I would not have travelled this country from one end to the other, lecturing and teaching as I have, to make a reputation in the government or for the government, and that is not selfish. There is for me the reward of personal satisfaction and the reward of accomplishment, and without it we will never retain what we have in medicine today. The great mistake which the people who have not been raised in medicine make, the great mistake which the laity make who largely plan many of these schemes of state directed medicine, with all the goodness in the world in their souls, is that they think of medicine as a commodity. Medicine is not and never can be a commodity, and if it becomes a commodity you will not like

it, I will not like it, and the patient will not like it either because as a commodity it will not be good. There is an intangible something in medicine that lay people laugh at, that makes doctors want to do it, that makes them willing to get up at night. It makes them willing to do charity without vanity. If you make medicine into a commodity they will never want to do those things with the same willingness. If they do them, they will do them because they will have to and not because they want to.

Again, the mistake is made, I think, of talking (if I can, I want to avoid contentious terms) about medically underprivileged areas. I say I want to avoid contentious terms because if ever we need a calm approach to this problem, we need it now. We talk about regions where medicine is limited in quality and not good. This is true, but you could never make it and keep it as good as you would like to have it. Why? Because it is not medicine that is not good; it is economics, and you cannot make medicine survive at the desired level in a region which is economically undesirable.

The thing that I have repeatedly said is, take veterans' care as an example of government directed medicine, and I say this with regret because, after all, who is responsible for veterans' care? We are. It is only recently that we have shouted about it. We have known how bad it was, and we have not done anything about it. It has been here under our eyes for years. I doubt if there is a prominent surgeon who has not been rescue-man for a Veterans' Hospital, and has undone and done over things that have made him know that the medicine and surgery in many of them were not up to average standard. It has been excellent in some Veterans' Hospitals, and therefore we must not damn the whole for a relative percentage. But the point is this: if you want a living example of government directed medicine, look at the Veterans' Bureau as it was. It was government directed medicine at its worst. It is not fair to say that it was government medicine as it will be under the present national program of veterans' care under General Bradley and General Hawley, but it is an actual living completed experiment of what a national program of government dominated medicine did degenerate to. It is for that reason that I plead that it is so easy to promote a plan and not foresee its possible future consequences.

As related to the compulsory feature of medical care, I should think that this country after its experience with trying to legislate morals and sex and an appetite for alcohol would have learned by now that there are some things that must come by evolution and education and do not come by compulsion. They cannot come that way. The way to make better medicine in this country is to make better doctors and

to teach people what better medicine is, so that knowing what better medicine is, they will want it, and that is the thing that makes things develop along the line, I believe (to be a little religious), on which the Lord meant them to develop, and that is by evolution. The human mind is not capable of projecting itself sufficiently into the future to visualize the complications that will inevitably arise and in some unpredictable degree affect what now appear to be such positively good results. It is a new and greener pasture over the hill, and that does not mean that medicine does not need some changes. It does in many ways, but compulsion in any opinion will not accomplish it.

We doctors need, I believe, to progress in some of our ways, and here are some of the personal ways. We have been a little too sanctimonious in medicine. The Irish have a saying that I got from Eddie Cuniffe, who is a typical Irishman. He said that his father once said to him, "From the Saints on earth, may the Saints in Heaven preserve me". The thing we have been a little saintly about is that we believe the way to do good is to do it and say nothing about it. That was all right until we had so much cult competition and lay criticism. For example, remember what Dr. Goldwater wrote about hospitals. He said, and it is so true, "Hospitals are constantly advertised by the amount of charity they do. That is true. And hospitals are supported on the basis of the charity they do. But for every dollar of charity they do, some doctor does a dollar's worth, too, that makes it possible, and hardly ever gets a bit of credit for it because he has created the attitude that it is his inherited obligation. Most of the credit goes to the hospital." Therefore, if we can, properly and with due modesty, we need to assert ourselves a little more in terms of what we are and what we are quietly doing today and every day of our lives.

Doctors over the years have been not unlike good wives. Really good wives do not go around telling husbands what good wives they are. I have repeatedly said that they are a great deal like the medicine the public has had over the years and has today. To be fully appreciated and realized, a good wife has to die. So conscientious and so self-effacing are most of them that it is only then that they are fully appreciated by their husbands and families.

Let us for a moment detach from medicine that intangible sentiment which doctors have for it as it is today and think what would happen if we formed a union and went on strike for a week or more. The contemplation of such an inconceivable situation in medicine as it is today might bring home to some of the irresponsible minds in this country to what an end some of the service stoppages which are now happening could come. In connection with compulsory government dominated medi-

cine—and any compulsory plan must be government dominated—one might well inquire as to whether or not under such a system we could be as sure that it might not happen as we can be that it could not happen as medicine is practiced today.

If I have to choose sides in this contest, let me have the slow and sure one, the one with a long record of accomplishment with its defects now demonstrable, and not the quick and uncertain one with no real record of accomplishment, with its defects unknown in effects and unpredictable in extent.

MEN and BOOKS

THE ANNUAL MEETING AT BANFF, IN 1889

By H. E. MacDermot

Montreal

It is 57 years since our Association held its annual meeting in Banff. That is a long interval, containing tremendous developments, national and international, and it may be interesting to look back on some of the circumstances of that 22nd meeting as they have been recorded.

When the Association chose Banff in 1889 it did so on the recommendation of Dr. George Ross, of Montreal, who had visited the Coast in 1888 and was so impressed by his trip that as President of the Association he strongly urged that Banff be the venue. The Association was in its very early youth; the Treasurer's report at this meeting, for instance, showed only 89 paid members, but it had plenty of energy and the meeting was an enthusiastic one, more than 150 being in attendance.

The trip from Montreal was described in a letter to the *Canada Medical Record* by one of its editors, Dr. F. W. Campbell, from which the following extracts are taken:

"When the Canadian Pacific Railroad Company's Pacific Express steamed out of the Dalhousie Square Station, Montreal, on the night of the 6th of August, it had three sleepers well filled with medical men from Montreal, the Lower Provinces and the United States—all bound for Banff, in Alberta Province, North-West Territory, to attend the annual meeting of the Canadian Medical Association on the 12th and 13th of August. The start was made ten minutes late, and this was increased to fully an hour at the Mile End Station, waiting for connection with the train from Boston. When North Bay was reached next day we were four hours behind. Here we were joined by a number of medical men from Toronto. From this westward, we gradually fell behind, partly from the heaviness of our train, and partly also to a hot box. Time passed pleasantly, although on the 7th and 8th inst. we only had two meals a day, not striking a dining car till late in the afternoon. This *contretemps* was taken in good part by most—but writing now for the public, I think this misfortune ought to have been avoided.

It was not pleasant to have to wait to 2 p.m. for breakfast as many had to do.

"The scenery through which we passed on the borders of Lake Superior was very grand. On Friday, 9th inst., at 4 p.m., we reached Winnipeg. Most of the members drove at once to the residence of His Honor Dr. Schultz, Lieutenant Governor of Manitoba, who gave a garden party in our honor. The music was supplied by the band of the Mounted Infantry School; a couple of hours was thus passed most agreeably; at 9 p.m. the profession of Winnipeg and vicinity gave a dinner at the Queen's Hall, at which Goldwin Smith was present. The menu and service of this repast was almost perfect—a better dinner or a more liberally served one, I think is rare. Speech and sentiment followed rapidly and it was 2 a.m. on Saturday before the party broke up.

"At 9.30 the entire party were taken by special train to Stoney Creek Penitentiary, where they were received by Superintendent Col. Bedson. The Indians incarcerated here for the Frog Lake Massacre, during the North-West Rebellion, were paraded in full paint, and went through a war dance, and various other performances. The party returned to Winnipeg about noon,

ten o'clock on Monday, the 12th, the meeting of the Canadian Medical Association was called to order in the theatre by the ex-President, Dr. George Ross, of Montreal, who introduced the newly elected President, Dr. Wright, of Ottawa. This gentleman delivered a very able and instructive address—but altogether too long—tiring out many of the members.

"The afternoon was passed in sight-seeing, the only business done being a meeting of the Nominating Committee at five o'clock. In the evening the Association undertook to amend its by-laws, the whole evening being occupied in this work. On Tuesday the real work of the Association was entered upon, and many valuable papers read; one of the most interesting being on the Climate of Southern Alberta, by Dr. Kennedy, of Macleod, formerly surgeon in the North-West Mounted Police. . . .

"This meeting has been most successful. No one who helped last year at Ottawa to decide in favor of Banff for this year's meeting could have hoped for a more representative gathering. They came from the east as far as Cape Breton and Nova Scotia. In fact every Province of the Dominion, except Prince Edward



Fig. 1.—Twenty-second Annual Meeting, Banff, 1889.

(Courtesy of Dr. Heber C. Jamieson)

and shortly after one o'clock left by special train for Banff. The trip across the prairie was enjoyed for a time, but by night became somewhat monotonous. About ten o'clock the cry of 'prairie on fire' drew our attention to a magnificent spectacle—one which I will not soon forget. For a mile or more the prairie was a mass of flames. Being a special, our train made few stops. On the day after we left Winnipeg the prairie was undulating, with patches of trees here and there. We passed many dry alkaline lakes, the deposit making them often look like marble quarries. About five o'clock p.m. we approached Calgary, striking the Bow River, a beautiful stream, whose wooded banks were a great relief to the eye, after the hundreds of miles of prairie land we had crossed.

"After leaving Calgary, we followed the Bow River for some thirty miles, the land gradually rising into good sized hills, and then into magnificent mountains, which to our amazement we learned were only the foothills of the Rockies. About eight o'clock we reached Banff, and the entire party were rapidly conveyed in busses and carriages to the hotel. This was not capacious enough for the new arrivals, many of whom had to double in rooms. The manager, Mr. Mathews, however did all he could to make us comfortable. At

Island and New Brunswick, was represented. One gentleman, Dr. McInnis, of Edmonton, rode from there to Calgary, when he took the train, a distance of two hundred miles, to attend the convention. From the United States there were many and distinguished visitors, among them Dr. Barker, of Philadelphia; Dr. Bulkley, of New York; Dr. Gibney, of New York; Dr. Marcy, of Boston; Dr. J. A. Gordon, of Quincy, Mass.; Dr. Connor, of St. Louis, Ills; Dr. Whittaker, of Cincinnati, and many others. . . ."

Among those from Montreal were the following: Drs. Roddick, Gardner, Buller, Rodger, Geo. Ross, Stewart, Wilkins, Armstrong, Mount, Lachapelle, Hingston, McCallum, Bell, Shepherd, F. W. Campbell, Trenholme and Fenwick. The first four went ahead, with the intention of "doing" British Columbia before the meeting began, and we may be sure that they carried out their intention.

The Toronto group joined the party at North Bay: it included J. H. Richardson, R. A. Reeve, L. McFarlane, F. Grasett, C. O'Reilly, J. E.



Fig. 2.—An artist's conception of Banff in the early '90's. Both the hotel and the fashions of the time have changed considerably!

(Courtesy of the Canadian Pacific Railway Company)

Graham, Adam Wright, W. H. B. Aikins, E. E. King, J. S. Ryerson, I. H. Cameron, C. Sheard and J. E. White.

The sessions seem to have been held in a theatre, as the Treasurer's report shows an item of "Moulton's Theatre Company, \$20.00" (although a little later there is a note "Reduction in charge for use of theatre \$5.00").

The second day was a busy one as there were 18 papers to be read and discussed. An evening session was necessary, but even so 4 papers had to be read by title only. All accounts agree that the meeting was a complete success. It was before the days of multiple committees, and the organization work was done by a few men only. One account says: "The able, genial and popular President, Dr. H. P. Wright, made a rarely good chairman and conducted affairs in a most happy and satisfactory manner and a large amount of credit is due to Dr. Geo. Ross, of Montreal, who worked faithfully and well to make the meeting a success . . . but let it be recorded in letters that will never fade, that the name of the most indefatigable and patient labourer in the vineyard was Dr. James Bell, the worthy secretary, of Montreal." However,

* *The Canadian Practitioner*, 14: 340, 1889.

it was necessary at the close of the meeting to express regret that the Association would be unable to present the usual honorarium to the Secretary.

A letter was received from Sir John Schultz, Lieutenant-Governor of Manitoba, who regretted his inability to be present. After making some historical references to the early medical explorers his Western expansiveness of mind took possession of him.

"I would ask my learned confrères," he said, "when the discussion of more scientific questions shall have been completed, to pause and reflect for a moment that they are where for economic purposes Canada is widest, and no longer a mere arable strip on the banks of the St. Lawrence."

One resolution passed at this meeting is of interest. It was moved by Dr. W. S. Muir, of Truro, N.S., and seconded by Dr. Shepherd, of Montreal, "That the local provincial secretaries be requested to ascertain the feeling of the medical societies of their respective provinces on the subject of affiliation with the Canadian Medical Association." It was to be many long years before this feeling was ascertained, much less translated into the federation we now enjoy, but the desire for it expressed itself even thus early.

ASSOCIATION NOTES

SEVENTY-SEVENTH ANNUAL MEETING OF THE

Canadian Medical Association

TO BE HELD IN THE BANFF SPRINGS HOTEL, BANFF, ALBERTA

JUNE 10, 11, 12, 13, 14, 1946

<i>President</i> - - -	DR. LÉON GÉRIN-LAJOIE, Montreal
<i>President-Elect</i> - -	DR. WALLACE WILSON, Vancouver
<i>General Secretary</i> - -	DR. T. C. ROUTLEY, Toronto

ACCOMMODATION

It is with regret mingled with some pride that we are obliged to announce that all hotel accommodation at Banff has been sold and that it is useless for members who have not made hotel reservations to ask for them now.

Members who have reservations and find that they cannot use them are urgently requested to let the Housing Committee know immediately in order that the space may be made available to someone on the waiting list.

PROGRAM

The Program was published in the April issue. There are two or three corrections which will be found in the final program to be distributed at the meeting.

TRAVELLING

Once again we are privileged to announce that the Canadian Passenger Association has authorized special convention rates by the use of Identification Certificates which may be obtained on application to the General Secretary. The arrangements are as follows:

For points east of Port Arthur travelling on the Identification Certificate may begin any time from June 1 to June 7 inclusive.

For points west of Port Arthur the Identification Certificate may be used any time from June 4 to June 10 inclusive.

Round trip tickets are sold at the rate of a fare and a third of current fares plus twenty-five cents.

Summer excursion fares, where on a lower basis than convention fares, will also apply.

There is a return limit of 30 days from date of sale. Passengers must reach the original starting point not later than midnight of the final return limit.

THE BANFF MEETING

GENERAL ARRANGEMENTS

The arrangements for the Meeting are well in hand. It had been hoped to arrange for special trains to run from Vancouver to Banff, but we are told that it is rather doubtful if this can be arranged, and members from points in B.C. had better make their arrangements accordingly. Members, however are asked to notify the Central Office of the dates on which they intend to leave for Banff.

A very special booklet is being compiled for the Meeting, by a Committee working under the Chairmanship of Dr. W. H. Hatfield. This will constitute a memorable souvenir of the Annual Meeting, which is to be known as the "Victory" Meeting. It will be profusely illustrated, and is a work of art. The keynote of the booklet will be Canadian Medicine at War, and many special articles are being contributed for it by eminent men from all parts of Canada. Figures and statistics will be published, showing the numbers and names of those who joined the various Services, and an Honour Roll, of those who lost their lives, and of those who received wounds, will be included. A separate column will record the Awards and Decorations won by those in the Medical Services.

The work of the R.C.A.M.C. will be dealt with, and there will be an article on the Red Cross, and the Blood Donor system that rendered such magnificent service. The Department of Veterans' Affairs will have a place, and the Canadian Medical Intelligence Department as well. Special articles will be:

The National Research Council, by J. B. Collip; Penicillin—its production; The Canadian Hospitals Overseas, by Athol Gordon; Hospitals of Canada during the War, by Harvey Agnew; Medical Work in the Royal Canadian Navy, by MacCallum and Best.

The booklet will open with a short preface, welcoming the returning men and women to our midst. There will be some pages dealing with Banff, and a good deal of space will be

devoted to British Columbia, as a wonderful place for an extended holiday. We hope that many of those who attend the Meeting will see their way to making a visit—the longer the better—in other parts of B.C. In June, this province offers special attractions for visitors, and we in British Columbia, who are your hosts for this Victory Meeting hope that we may be allowed to show you some of them.

The printing of this booklet, which will be given free to all those who attend the Meeting, has been made possible by two things. First, many of the leading firms of Canada, who deal with medical and pharmaceutical supplies, have contributed. They are all carefully selected, and are all thoroughly reliable, and we urge the readers of the booklet to pay special attention to their displays. But another main source of revenue, which we most gratefully acknowledge, has been the gift of sums of money by well-wishers of the profession, who have asked that their names be withheld. The total of these gifts is very considerable, and we thank these friends of ours sincerely.

ENTERTAINMENT

In previous articles we have touched on the entertainment of visitors, and especially of the ladies who will attend. Mrs. Wallace Wilson, wife of the President-Elect, is looking after this, and her Committee has an excellent program arranged. We have referred also to the various attractions offered at Banff. Of course, during the Meeting itself, it will not be possible to take advantage of all these, and that is an additional reason for extending your stay a bit. But the program includes certain set pieces, which will be open to all. Thus, on Tuesday night, the B.C. Medical Association will be giving a Dinner, while the next night, Wednesday, will be given over to the Ceremonial Meeting of the Canadian Medical Association, when officers will be installed, and the traditional rites and ceremonies which have been followed for years will be observed. Thursday will be given to golf, and a tournament is being arranged for the afternoon. Friday, the last day of the Meeting, will be signalized by a grand final dance in the evening, which all are invited to attend.

During the Meeting, in the evening, orchestras will be in attendance, and one may hear any sort of music he or she cares for. Opportunities will be given to the younger people to organize amusements for themselves. And there is always such things as the odd game of golf, bridge, probably informal dances, and always the great swimming pools of the Banff Hot Springs Hotel, where one may relax and thoroughly enjoy himself or herself.

For those who care to ride, there are always horses to be had, there are motor trips, trails for those who wish to hike, and numerous places to visit.

THE SCIENTIFIC PROGRAM

The detailed programs of sectional meetings, general assemblies, names of speakers, and so on, have all appeared in the columns of the *Journal* elsewhere, and those of us who have sat in at the meetings where the various sections have been reporting their activities, can assure you that there will be plenty to everyone's taste. It seems a great pity that one cannot take them all in, but no doubt we shall be able to read them at our leisure in the *Journal* as opportunity arises for their publication.

Amendments to the Constitution and By-Laws

At the annual meetings in 1944 and 1945, General Council discussed certain proposals for revision of the Constitution and By-Laws designed to broaden the membership of General Council and make it more representative of every aspect of Canadian medicine. After open discussion, General Council instructed that the proposals be given further study.

The Committee on Constitution and By-Laws now recommends that the membership of General Council be broadened by the inclusion of:

1. Representatives from the Medical Schools of Canada.
2. Representatives of undergraduate students and interns.
3. Representatives of certain affiliated societies.
4. And that there be members upon the Executive Committee elected at large from General Council.

In order to accomplish the above, it is recommended that:

(1) Article IX of the Constitution—The General Council—be amended by the addition of the following clauses:

- (h) Representatives of the Medical Schools of Canada.
- (i) One representative from each affiliated society whose members are doctors and members of the Canadian Medical Association.
- (j) Representatives of undergraduates in medicine and interns.

(2) Chapter VI, Section 2—Duties of the Nominating Committee—Clause (2), be changed to read as follows:

Nomination of an Executive Committee, which, in addition to those who are members *ex officio* (see Chapter VIII, Section 4) shall consist of sixteen members drawn from General Council, three as members at large and thirteen geographically distributed as follows: three shall be resident in each province in which an office of The Association is located, and one shall be resident in each of the other provinces.

The General Secretary's Page

The President of one of our largest Divisions (name on request) remarked to me a few days ago that both he and his wife were highly pleased with the message in the *Journal* from the wife of our President-Elect, telling the wives what to wear at Banff. His wife was sure the visiting ladies would be grateful to Mrs. Wilson for her thoughtfulness in telling them just what they desired to know about such important items as clothing. I hope you will draw your wife's attention to the article before the bags are packed for the Victory Meeting.

But, then he gave me a poser by saying that I should tell the men what to wear. I am no sartorial artist nor authority on what the well dressed man should wear, but I am willing to take some risks for a good cause; so here goes: (Check off as you pack.)

1. Your one-remaining suit, plus the new one if you have been lucky enough to get it from the tailor before June.

2. A top coat. It will be cool.

3. A rain coat. You may not need it but it is splendid insurance.

4. A dinner coat—black tie. If you are a platform celebrity, your tails and white tie; but either will do. And if you cannot pour yourself into these ancient garments—come without them.

5. A sports jacket and some flannel trousers. (Try and get them.)

6. Riding clothes if you are addicted to horses.

7. Swim suit. You can rent them, but it is nicer to slip on your suit and dressing gown in your own room and go down to the pool. (Hot or cold, whichever you prefer.)

8. Your usual golf armamentarium. We hope caddies will be available but they may be in short supply. (How much can you carry?) Bring something, even if you haven't played for years. When you see the beautiful Banff links you will be willing to go around with a shinny stick.

9. Excellent tennis courts for those who still pack a wicked racket and are on the right side of forty. Which side?

10. Red flannels, or B.V.D.'s, shirts, collars, ties! Now, wait a minute; this is going too far. From here on, you are on your own; but, above all else, bring along a mental attitude which fits into this Victory Meeting; and then, all who are fortunate enough to be there will long remember a week of right good fellowship and pleasure.

What has happened to Health Insurance?

What has become of the Family Doctor Plan which was announced many months ago by the Department of Veterans' Affairs?

These are two questions frequently directed to the General Secretary.

With regard to Health Insurance (and by that I mean the discussions which have been going on about it in the Dominion-Provincial Conferences) it would appear to be in suspension. As readers are aware, it was interjected into Dominion-Provincial proposals as a relatively important item entailing an annual expenditure of something in the neighbourhood of \$250,000,000, and, until and unless the Federal and Provincial Governments agree upon a basis of taxation and division of revenue, it is unlikely that anything further will be done to advance national health insurance in Canada.

It is no secret that the heads of the Provincial Governments meeting in Ottawa, displayed no great enthusiasm for the federal proposals. On the contrary, they made it plain that they would institute health insurance in their own way and in their own time, not forgetting to emphasize that health is a matter of provincial jurisdiction. It is alleged that two of the provinces, namely, Saskatchewan and Manitoba, show some eagerness to get on with health insurance; but, as far as can be ascertained, the others do not appear to be in any hurry to adopt the measure.

Health Insurance is not dead by any means. One day it will be here, but it is a credit to our people that they are not rushing into a costly piece of social legislation such as this would be until they see more clearly what it all means, what it will cost and on what basis it can be adequately and fairly financed. Meanwhile, the medical profession is well advised to continue its study of the subject.

In June 1945, the Honourable Minister of Veterans' Affairs announced that a plan was being devised to permit returned soldiers to secure medical care from the doctors of their choice. This was called the "Family Doctor Plan". Our Association was invited to prepare a tariff and appoint medical advisory committees. In October, each of the nine Divisions sent a delegate to a tariff committee meeting in Ottawa. For several days these representatives considered carefully the preparation of a tariff which was later approved by the Executive Committee and tabled with the Department of Veterans' Affairs on December 15, 1945. Subsequently, we were advised that the tariff had been approved by the Department and that it was anticipated that the scheme would become effective in January, 1946. But days have stretched into weeks and weeks into months, and, at the time of writing, the plan is still being held in abeyance. The

fact of the matter is that the Treasury Board has not given its approval to the tariff, stating that it is too high.

Comparison with Provincial medical tariffs and American tariffs discloses that the tariff is a reasonable and fair one. True, it is higher than the old Department of Pensions and National Health tariff, but so it should be.

Perhaps before this page is read the scheme will be in effect. We devoutly hope so; but as the delay has been so long and as so many members have inquired why, it seems desirable that an explanation be given at this time.

MEDICAL SOCIETIES

La société médicale des hôpitaux universitaires de Québec

Séance du 12 décembre 1945.

LA PÉNICILLINE QUELQUES CONSIDÉRATIONS BIOLOGIQUES.
—M. Giroux.

L'article résume les données actuelles concernant la pénicilline, au point de vue biologique. L'historique de cet antibiotique est étudié brièvement sous les trois chapitres suivants: 1° Découverte de Fleming; 2° Travaux de Florey; 3° Production américaine. Puis suivent quelques notions physiques, chimiques de la pénicilline, avec quelques procédés d'extraction.

Il est fait un tableau des différentes méthodes de dosage de la pénicilline, tant au point de vue de l'unité Oxford Florey, que dans leurs applications au Laboratoire clinique. En terminant, l'auteur présente un tableau de quelques antibiotiques les plus récents et encore à l'étude.

CONSIDÉRATIONS GÉNÉRALES SUR LES RESULTATS OBTENUS
PAR LA PÉNICILLINE EN CLINIQUE.—Renaud Lemieux.

L'auteur fait quelques considérations générales sur l'importance de la découverte de la pénicilline, sur les modifications qu'elle a apportées dans le pronostic d'un certain nombre d'infections, sur son action bactéricide, sur son mode d'emploi, sur son élimination, etc. Il fait une revue de la plus grande partie de la littérature américaine publiée sur l'usage clinique de la pénicilline depuis 1941.

Pour la facilité de l'exposition, le travail est divisé en 7 parties, soit: l'infection du cœur et du sang, du système nerveux, des voies respiratoires, du système osseux, de la peau et des tissus mous, le système génito-urinaire et les infections diverses. Il fait l'analyse sommaire de 244 cas de septicémie et d'un certain nombre d'endocardites infectieuses traitées par la pénicilline seule et par la pénicilline-héparine. Au chapitre des infections du système nerveux central, l'auteur passe en revue les méningites à méningocoques, à pneumocoques, à staphylocoques et à streptocoques.

Dans les infections du système respiratoire, la pénicilline et les sulfamidés paraissent donner, en thérapeutique, des résultats à peu près identiques. Dans les infections du système osseux: les infections aiguës à staphylocoques bénéficient du traitement à la pénicilline tandis que le problème de l'ostéomyélite chronique demeure inchangé. Dans les infections de la peau et des tissus mous: l'usage de la pénicilline a donné des résultats intéressants. Plus de 7,000 cas rapportés d'infection urinaire par le gonocoque sont analysés en groupe. L'auteur fait quelques considérations sur les échecs racontés dans 3% des cas sous traitement. Les infections gangréneuses, les infections

à virus, les anthrax, etc, ont bénéficié d'une façon variable du traitement à la pénicilline.

Des antibiotiques sont encore à l'étude dont la pénicilline est un des premiers qui se soit montré réellement actif; il est permis d'espérer que dans un avenir très rapproché ces médicaments sauront combler des insuffisances qui ont été notées jusqu'ici dans l'emploi de la pénicilline.

TRAITEMENT DE LA SYPHILIS PAR LA PÉNICILLINE.—Jean Grandbois.

A la suite des quatre premières observations, publiées par Mahony, Arnold et Harris, en décembre 1943, la pénicilline fut employée dans plusieurs centaines de cas de syphilis. De tous ces travaux, on peut dire que la pénicilline est un agent thérapeutique efficace dans la syphilis récente ou tardive. Ses résultats immédiats, qui consistent dans la disparition rapide des tréponèmes et la guérison des lésions superficielles, se comparent favorablement à ceux obtenus par les arsénicaux, et sans présenter les dangers de ceux-ci. Ses résultats tardifs, par lesquels seuls, il sera possible de juger du degré réel d'efficacité de la pénicilline, aucun syphilologiste ne les connaît.

Les doses totales de pénicilline conseillées aujourd'hui sont de 2,400,000 dans la syphilis récente, et 4,000,000 U.O. ou plus dans la syphilis tardive. La période d'administration est de huit à douze jours, à raison d'injections intra-musculaires de 25,000 à 40,000 U.O. toutes les trois heures. L'auteur termine en se demandant, si la pénicilline réalisera dans le futur, le rêve d'Ehrlich, d'une seule injection stérilisante.

Séance du 21 décembre 1945, à l'Hôtel-Dieu de Québec, à 8 heures 30 du soir.

RESPIRATION SOUS PRESSION POSITIVE DANS LES TRACHÉOTOMIES.—Fernando Hudon.

Après la trachéotomie, on voit apparaître souvent chez un malade qui ne toussait pas et n'expectorait pas auparavant, une sécrétion abondante de sérosité et de mucus dans l'arbre bronchique nécessitant de fréquentes aspirations. La pression fortement positive de l'expiration étant disparue, n'exerce plus de compression sur les vaisseaux dilatés auparavant par l'asphyxie et la succion exagérée de l'inspiration. Pour tarir les sécrétions, Barach a préconisé l'expiration sous pression positive de 1 à 6 c.c. d'eau pendant quelques jours. A cet effet, l'on se sert d'un dispositif à double valve pour la respiration et d'une bouteille d'eau graduée. L'appareil est en communication d'une part avec la canule de trachéotomie par un tube et d'autre part la valve expiratoire communique avec la bouteille d'eau.

Nous avons traité ainsi et avec succès quatre cas de trachéotomisés.

DERMATOFIBRO-SARCOMES DE DARIER-FERRAND.—Jean Thomas Michaud.

Décrits par Darier et Ferrand, en 1924, ce sont des tumeurs fibreuses, dermo-hypodermiques, d'évolution néoplasique, qui se développent sur une plaque fibreuse ayant débuté des années auparavant et dont le siège habituel est au niveau de la paroi abdominale. Leur évolution est progressivement extensive et elles sont réfractaires aux traitements qu'on veut leur opposer. Mais leur malignité est purement locale et on n'a jamais pu observer de métastases, ce qui en fait donc une entité clinique bien distincte. La durée est illimitée, l'état général n'en ayant nullement à souffrir.

Au point de vue histologique, ces tumeurs présentent une dualité sarcomateuse et fibromateuse. Leur nom indique bien la structure sarcomateuse avec mitoses et vaisseaux sanguins à parois lacunaires d'une part et, d'autre part, l'aspect fasciculé d'un fibrome simple, ainsi que l'absence de malignité générale et de propagation métastatique.

Réfractaires aux traitements, ces tumeurs ne sont curables que par une exérèse chirurgicale complète faite au delà des limites de la tumeur. Au cours de cette année, 10 nouveaux cas ont été traités par la chirurgie. Ils étaient à localisations diverses et évoluaient depuis nombre d'années. Signalons en passant la simultanéité tumorale chez une mère et sa fille. Les plaies opératoires ont guéri normalement, mais le recul n'est pas suffisant pour porter un jugement.

TUMEURS DE LA GLANDE MAMMAIRE CHEZ L'HOMME.—
Carlton Auger.

68 tumeurs de la glande mammaire chez l'homme sont rapportées. 56 sont des hyperplasies fibro-canaliculaires d'origine probablement dysendocrinienne et 12 sont des épithéliomas. Cette série ne comprend ni adénome, ni sarcome.

LE THIOURACIL: ASPECT THÉORIQUE ET ASPECT CLINIQUE.
—J. Jobin et L.-N. Larochelle.

Le but de cette présentation est de faire une mise au point de la question du thiouracil: aspect théorique et clinique. Après avoir vu les affets du thiouracil sur la glande thyroïde de l'animal, nous considérons le danger de la manipulation de ce médicament, chez l'homme, en raison de ses effets toxiques secondaires possibles, surtout l'agranulocytose qui est parfois mortelle. D'où la nécessité d'un contrôle régulier et fréquent de la leucocytose. Le thiouracil, employé avant l'intervention chirurgicale, se montrerait aussi bon que l'iode, avec cette différence qu'il demande un peu plus de temps pour préparer le malade, mais le traitement peut être ambulatoire et l'intervention est moins choquante.

Le thiouracil a aussi été employé comme traitement médical simple du goitre toxique et l'on rapporte des guérisons définitives dans environ 20% des cas.

Dans le Service de Médecine de l'Hôtel-Dieu, nous avons employé le thiouracil pour le traitement de vingt-neuf cas de goîtres et nous avons observé parallèlement un nombre égal de cas traités au Lugol, toujours comme traitement préopératoire.

Voici nos conclusions: Le traitement préopératoire du goitre par le thiouracil, dans nos conditions de travail, n'a pu faire mieux que le traitement habituel par la solution de Lugol. Etant donné que, d'une part, le thiouracil allonge la période préopératoire et expose à des accidents que ne connaît pas l'iode; étant donné que, d'autre part, le traitement ambulatoire ne vaut que pour un nombre restreint de malades et dans un certain périmètre des hôpitaux, nous croyons qu'il vaut mieux continuer à employer le Lugol.

A la lecture des protocoles opératoires, nous sommes frappés par le fait que, fréquemment, le chirurgien signale des altérations de la glande thyroïde. Cette glande est devenue plus molle, plus friable et plus vascularisée ce qui engendre des difficultés de technique opératoire. Ces constatations sont corroborées par les rapports anatomo-pathologiques consignées aux dossiers où il est fait mention, entre autres choses, de la présence anormale de foyers hémorragiques.

Il n'en reste pas moins que le thiouracil peut être un médicament de choix pour les malades qui refusent l'intervention chirurgicale ou encore pour les jeunes de moins de vingt ans toujours avec cette réserve qu'ils devront s'astreindre à des contrôles leucocytaires répétés.

MISCELLANY

How the Socialist Looks at National Health Service in England

A mass meeting of the Socialist Medical Association in England last February brought out the following comments.

Dr. D. Stark Murray, the chairman said:

"We have always stood for a complete change in health service arrangements. We stand today for a complete service universally available and free to all citizens, one that will give to the people in health and in sickness a service such as they have never had before. We are very pleased and proud that the Labour Government in its first six months of office, facing tremendous national problems, should include this health service, which we have advocated as so vital to the people of this country, as one of the first things to go through the legislative mill. . . ."

"Dr. Edith Summerskill said that this was probably the last occasion on which the Socialist Medical Association would be discussing aims and aspirations; the next time they met they would be discussing the details of the Bill. The late Miss Eleanor Rathbone once told her that there was always a lapse of 25 years between the inception and the fruition of any new idea. Well, it had not been so long in this field: they had had to wait only 15 years.

"She could not foreshadow in public the details of the new Bill, but on that occasion it seemed right to indulge in reminiscence. Her recollections went back to the first days of the Socialist Medical Association, at a time when a Socialist doctor was an 'untouchable' and when, at Mr. Summerville Hastings's house, if six people attended they rejoiced in a 'jolly good meeting'. They all knew at that time that a Socialist Government would not be seen for many years to come, but they thrashed out the details of a State medical service as though a Bill was to be presented the following week. She traced the history of health achievement through the present century, from the Midwives Act, 1901, when Mrs. Gamp said farewell, through the medical inspection of school-children in 1909, the advent of National Health Insurance in 1911, the Maternity and Child Welfare Act in 1918, and the Local Government Act of 1929. All these reforms had come about because the advocates of preventive medicine had been able to educate successive Governments. 'And now we reach the end at last when we shall be able to consolidate all these activities and have a comprehensive health scheme.'

"The medical profession was one of the most conservative in the world, but she forgave it. It was because our health service organization was such that doctors were terribly overworked and so tired out at the end of the day that they could read nothing but the *British Medical Journal*."

This is the uncompromising attitude of the socialist devotee. More moderate is the criticism of the profession for its lack of initiative as voiced by Dr. John H. Wilson (*Brit. M. J.*, February 23, 1946).

"The letters in the *Journal* of February 2 (p. 185), under the heading 'A Fundamental Principle', were they to be widely circulated in the daily press, could only convince the State or community that the medical profession is, in so far as the writers of these letters are representative of it, entirely selfish and unconcerned for the welfare of humanity as a whole. It is unfortunately only too obvious that so long as there is a shortage of doctors there will be a tendency—natural, I admit, however deplorable—for the poorer, dirtier, and therefore more needy areas to suffer from lack of adequate medical care. This tendency is inevitable, human nature being what it is, and the situation can be met only by a planned medical service, whereby an adequate number of doctors are directed to the needy areas. Had the profession as a whole in its discussion of the State medical service question showed some real concern for

Books let us into the souls of men and lay open to us the secrets of our own. They are the first and the last, the most home-felt, the most heart-felt of our enjoyments.—Hazlitt.

the welfare of the people, as opposed to that of the doctors, one might have hoped for a natural or spontaneous cure of this great medico-social malady. It is our own fault that the Government is about ready to take the cure out of our hands, and we cannot blame it.

"I should be the last to suggest that direction should be unlimited, but surely direction of young doctors, say, under 30, with some temporary discomfort and loss of freedom, is a small sacrifice to pay, albeit a vicarious one, for the betterment of the health of our large industrial communities. Dr. Eastwood suggests that the State or community is about to exploit us for their own benefit just as 'slaves are exploited'. Surely this 'noble' profession of ours, with all its culture, learning, and wide experience of life, could never become 'enslaved' merely because its work was ordered or its members directed.

"I venture to suggest that in accepting a full-time salaried State medical service, even though it may bring some restrictions on our professional or personal liberty, we shall be emancipated rather than enslaved. In the past many of us have been literally in bondage, with our practices mortgaged and with day-in-day-out competition, often against unscrupulous 'colleagues' whose financial position is more satisfactory than their medical ethics or their knowledge of medicine. I would submit that for the young doctor direction for a year or two to an 'undesirable' industrial area would prove much less soul-destroying than the present often unfair, competition that is inevitable under the profit-motive system."

Then comes the opposition, as instanced in the following samples of letters to the *British Medical Journal*.

One correspondent says:

"I have just returned to this country for demobilization after six years' service, and find that there is now nothing to stop Mr. Bevan introducing his medical service early in 1946. I have been advised not to apply for any job until we hear what he has to say.

"You suggest in a recent leader that the profession will not tolerate any proposal from Mr. Bevan which interferes with the freedom of choice on the part of doctor or patient, but I have yet to see any suggestion as to how we are to voice our disagreement. At the moment we sit, as on an abyss, awaiting Mr. Bevan's pleasure, while he and his Socialistic cohorts make merry with one of the few conservative bodies that has practised socialism throughout the ages. It is not for us to educate Mr. Bevan, nor do I believe that this Government understands a trade union (as they would have us called) that is not prepared to exercise the right of these bodies to strike against injustices.

"Supposing we do not like these proposals: supposing we find the pay and the hours too little and too long? Is the Negotiating Body (whose names I do not know) prepared to send out strike orders, or are we to sit back and accept the airy idealism of a party which has slipped into power on a wave of misinformed enthusiasm? In many ways one sees a parallel with the French Revolution, when the fervent followers of freedom and equality laid the foundation of democratic discord which is now synonymous with French Parliamentary procedure.

"The profession is being rapidly demobilized, and the plaintive cry of surgeon lieutenants, majors, and squadron leaders to special release no longer applies. What does apply is that on their arrival home most of these men will hesitate to take a job in this country until their future is clarified. First impressions are not always fair, but they are often vivid, and as a colleague of mine remarked, 'One's most vivid impression is that the profession at home is sitting back like a group of frightened rabbits mesmerized into inaction by a stoat'.

"Since in the eyes of the Government we are one of the strongest trade unions in the world isn't it time we applied more energetic tactics? Can't we fight this Government with its own trade union weapons? Is there any legal reason, so long as we are free, we should

not strike? Let us join the ranks of the dockers and boiler-makers and declare that if Mr. Bevan attempts to introduce a Bill for national health against our wishes we will refuse to work.

"It is said that he will man his ship with a skeleton crew drawn from the ranks of the Services: poor fellows who must needs seek money to keep their wives and families. Don't you believe it. I know that I speak for the majority of these men. We resent this suggestion, just as we resent the unwholesome speed with which the Government is putting this Bill through. We find very little evidence of co-ordinated thought in the profession, especially among those who have been on the spot. There is no leader and no following. The senior men, whom one would naturally turn to, are tired, and the few that I have met are most mesmerized. Already I have heard them say, 'Bevan means business this time'. Of course he means business; that's his job. What is ours?

Surg. Lieut.-Cmdr. R. C. J. HILL, R.N.V.R.

And another raises his voice more urgently:

"Professor Laski, in a recent speech, has characterized the B.M.A. as a tenth-rate trade union, who ought to seek affiliation with the T.U.C. Mr. Bevan, it would appear, has received the Negotiating Committee with the silent disdain of a nineteenth-century capitalist meeting a deputation of his employees. It seems that we are now enmeshed in an anachronistic Saturnalia. I must confess that all my life I have been attracted by socialistic theory. I have ever been on the side of the weak against the strong. That is why, when I see a Government which has dealt so gently with such powerful and vested interests as the banks, the railways, and the coal mines, turn in its power and wave a scarcely velvet mailed fist over a weakly organized body such as the medical profession, I find myself conscientiously objecting.

"Suppose—and it is a supposition—that the gentlemen of medicine were actually to strike, as a unified body, under the guidance of the B.M.A. By the forthcoming repeal of the Trades Disputes Acts such action would undoubtedly be valid. Moreover, it would be in the best traditions of those heroes of socialistic emancipation whose shades, no doubt, both Mr. Bevan and Professor Laski hold in deep respect. But would these two gentlemen accept this application of a principle which they have maintained so long and for which they have fought so hard? Would they be prepared to back the struggles of an exploited minority against the pressure of a vested interest? I fear they would not. We should see black-leg strike breakers, righteous denunciations, the full force of the law (of panel contracts), victimization—everything, in fact, but the reasonable consideration of reasonable demands from reasonable people.

"As a true Socialist I feel myself oppressed, and I issue a rallying call to my struggling brethren. Doctors of the land, unite! You have nothing to gain but your lives; nothing to lose but your chains. Let us demand full compensation for loss of savings, anticipated and invested (not loss of practice), pensions, an eight-hour day in a six-day week, holidays with pay, and a remuneration compatible with our responsibility. Further, in the face of ruinous rates and income tax, to say nothing of lack of domestic help, allow us to dispense with these barrack-like houses, so essential, in the eyes of the people, to a decent doctor. (Perhaps in time the public will allow us to be ordinary men and women, though at present that is too much to hope for.) Above all, we must demand free choice of patient: we have been victimized long enough. Though appendices flare and ulcers perforate we must have our rights. All men were born free and equal, and in this new age it is not fitting that we should continue as slaves of society. Arise, my friends, arise!

"I ask you, Sir, to preserve my anonymity, because I fear reprisals. 'Hell knows no fury like a Minister scorned'."

"MARXIST"

It is rather significant that there is this diffidence about signing his letter: other correspondents show it as well. Usually there is no hesitation in declaring themselves, even in the most outspoken expressions of opinion.

These are only random samples from a large volume of letters in recent British journals voicing apprehension and opposition.

Food and Recovery in Europe

We are concerned with the critical food needs of Europe. Without sufficient food the peoples of liberated and ex-enemy countries will not be fit either mentally or physically for the trials and labours that lie ahead of them. The importance of food as one of the indispensable prerequisites of recovery and stability is generally recognized, but the stringency of the supply situation in Europe at the present time is less fully appreciated. A positive and realistic approach to the problems with which we are confronted must be based on an objective examination of the evidence that can be obtained about the actual facts of this situation.

Even in normal times Europe needed food imports. She also depended on substantial imports of fertilizers and feedstuffs to maintain her output of crops and livestock products. Six countries on the western and northern edge of the continent (France, Belgium, Netherlands, Denmark, Norway, and Finland) used to import each year about 2 million tons of phosphate rock, 3 million tons of oil cake, 8 million tons of grain, more than half a million tons of fats and oils, and nearly half a million tons of sugar. Five Mediterranean and Central European countries (Italy, Greece, Yugoslavia, Austria, and Czechoslovakia) imported a million tons of phosphate rock, about 300 thousand tons of oil cake, a million and a half tons of grain, and more than a quarter of a million tons of fats and oils. When these imports were cut off food supplies were affected both directly and indirectly. Crop yields began to fall, grain and potatoes had to be diverted from feed to food uses, livestock numbers had to be reduced, and the output of animal products suffered even greater declines.

In addition to the interruption of normal trade many other factors have contributed to the progressive decline in agricultural output during the past five years. Most important among them were: the losses of draft animals through requisitioning by the Germans, shortages of fuel for tractors, scarcity of labour, deterioration of machinery and other equipment, and lack of certain ingredients required for the manufacture of pesticides. These factors operated with cumulative effects all through the period of the war. Finally, in the year just past, transportation practically came to a standstill and perishables spoiled on the farms. Refineries were short of fuel, and sugar beets rotted in the fields. In many regions the farmers suffered from the foraging and pillaging of advancing or retreating armies. As a result of the combined effects of all these factors agricultural production in 1945 to 1946 will be substantially below what it was in 1944 to 1945 and will be far below the prewar level.

Even if all the supplies produced within these countries could be brought under controlled distribution the levels of consumption provided would meet the barest minimum standards. In the current consumption year—the twelve month period from the 1945 harvest till the harvest of 1946 becomes available—indigenous production in Belgium would not provide for her population more than 1,100 calories per person per day. The corresponding levels in other countries would be roughly as follows: Greece 1,300, Netherlands 1,350, Norway 1,400, Italy and Austria 1,500, Finland 1,750, France 1,800. In actual fact, of course, the assumption that supplies could be equitably distributed among all members of the population is entirely unrealistic. The inevitable results of maldistribution must be taken into account. We must recognize that the nonproducer

groups in any country will suffer disproportionately from whatever food shortages occur. As a general rule the farm populations in all countries have been able throughout the war to maintain their own consumption at relatively satisfactory levels.

Food must therefore be supplied to Europe during the next nine months in substantial quantities. Shipments will come from many sources, but the amounts made available from this country will have to constitute an important part of the total—possibly as much as one-half of all that is sent. Let us raise our sights to a goal which would give continental Allies 2,650 calories, maintain the United Kingdom at her 1943 to 1944 level, and allow ex-enemy countries 80% of their prewar levels. On this basis import requirements would be roughly as follows: six Western and Northern countries 8 or 9 million tons; five Mediterranean and Central countries 7 million tons; Britain 9 million tons; Germany between 5 and 6 million tons; and Poland an uncertain amount which might be 2 million tons. For these fourteen countries taken together the total would be between 30 and 35 million tons. With these imports the consumption level in Britain would still be 300 or 400 calories lower than ours, that of continental Allies would fall short of ours by 600 or 700 calories, and that in ex-enemy countries would be 900 or 1,000 calories below ours. When account is taken of the distribution difficulties already called to attention it is clear that the levels for many of the urban groups would still be low.

From this sketchy analysis of European food needs it is clear that what is done between now and next harvest time will be of critical importance from the points of view of both relief and recovery. It is also evident that the contributions required from the United States will be substantial. We are in a position to supply large quantities of food without danger to the well-being of American consumers, but this cannot be done without effort and inconvenience. If an adequate and effective job is to be done we must be willing to limit our consumption of certain kinds of food and we must be willing to accept the controls that are necessary in carrying out an emergency program of this sort.

JOHN M. CASSELS,
Chief, Supply Analysis Division,
Office of Food Programs,
Foreign Economic Administration,
Washington, D.C.

Nutrition Reviews: February, 1946.

Examination for Membership in The Canadian Society of Laboratory Technologists

The Canadian Society of Laboratory Technologists has announced its rules and regulations for examination for membership in the Society, to be effective as of July, 1946.

1. *Age*.—Minimum age of 18 years.

2. *Education*.—Senior matriculation or the equivalent standing in the various provinces. Two science subjects are required, one of which must be chemistry. The required standing in the various provinces is as follows:

British Columbia.—Senior Matriculation.

Alberta.—Grade XII.

Saskatchewan.—Grade XII.

Manitoba.—Grade XII.

Ontario.—Senior Matriculation or Grade XIII.

Quebec.—Senior High School Leaving Certificate or Senior Matriculation of McGill.

New Brunswick.—Senior Matriculation or Grade XII.

Nova Scotia.—Grade XII.

Prince Edward Island.—First Class Licence Certificate of the Department of Education or Third Year Certificate of Prince of Wales College.

Newfoundland.—Senior Associate Diploma.

A transcript of educational credits must be submitted with registration form. Certificates will be returned upon request.

3. *Student Registration.*—Prospective students should apply for registration before starting the course. The fee is \$1.00 and this entitles the student to receive the *Canadian Journal of Medical Technology*, the official publication of the C.S.L.T. This registration will help to avoid delays in approving the application for examination at the end of the course.

4. *Application for Examination and Fee.*—\$15.00 payable with application for examination and registration forms. (\$3.00 of this is for the first year membership fee.) Depositing of this payment does not necessarily mean approval of application for membership.

5. *General Certificate.*—Applicant must have had at least 12 months' training in an *Approved School* covering the various subjects of medical laboratory technology.

6. *Examinations.*—Examinations are held twice yearly, in the latter part of April and the latter part of October. The examination is in three parts, oral, practical and written. *Pass Mark:* 50% on each subsection and a mark of 60% on the total. All applicants must take the examination.

For further details, apply to the Secretary, Miss Helen L. Smith, 294 Barton St. East, Hamilton, Ontario.

CORRESPONDENCE

Why Not Sickness Allowances?

To the Editor:

A year ago, even six months ago, some of us who are directly serving the public, were extremely skeptical of the efficacy of Family Allowances. We felt there would be too much abuse to make them worth while. We forgot that our womanhood has spent, according to our advertisers, more than 80% of the family income, and has spent it so wisely as to make our Canadian homes the envy of the world. We forgot that 80% of our mothers have average or better than average intelligence, and use that intelligence to buy wisely and economically and in such a manner that our standard of living is rising over the years instead of falling. Even the greatest war in history has not seriously lowered it, due to the intelligent, wise buying of our women who were, in their wisdom, obedient to price control. How then could family allowances fail? They have not failed. They are at least an 80% success, and what plan of child aid on so vast a scale has ever approached this measure of success in so short a time—well-baby clinics, pre-school clinics, anti-tuberculosis clinics? Family allowances already are showing their success amongst our lower income groups in the better physical condition of their school children and in countless other ways. We would gladly debate their worth with any person publicly at any time.

We, in Saskatoon, a city of 43,000 population, who have been at this school work for nearly twenty years in a place small enough to know nearly everyone, now know not only the children but usually one or both parents, and soon are aware of abuses of family income. To us, the undoubted success of family allowances has made dead as a dodo the various schemes for state medical care that have been suggested to us and even are in the process of being foisted upon us.

These schemes always fail in my opinion because:

1. They go into effect five or ten years after they are planned and thus do not meet existing conditions, which have changed since the plans were begun. Amendments to bring them up to date are always, to put it charitably, one or two or ten years behind meeting the conditions they are to correct. Thus the scheme never meets existing conditions.

2. The schemes are too rigid. An Act is required to change them and this takes many months and often great effort.

3. They are not efficient. No government, when it makes up its budget, can foresee the future. A budget allotment for medical care may exceed the plan one year, whilst the allotment for nursing is less than the budget, and so on.

4. They take income from the lower income classes who need every nickel they get. Remember, the lower the income a family has the greater the incidence of sickness in it.

Up to this year most of us had no answer to the so-called health insurance (really sickness insurance) plan proposed. We all sincerely and honestly felt that there was something wrong with it. Our feeling went deeper than our natural objection to be "regimented" and "regulated" by lay bodies. We knew something was wrong, else why had other countries constantly to amend, and change their original plans so often? We hesitated to talk publicly because we had nothing better to offer. We, except a very few individuals amongst us without conscience, felt there was urgent need of helping the lower income groups in some way. Therefore, we had to assist in forming a workable health insurance Act that, with all its limitations and injustices, we vaguely knew would fail in its purpose of bringing health. We had no honest alternative. We had to assist.

What today have we to offer? I humbly submit that the undoubted success of family allowances has murdered all our schemes of "health insurance". What then can we suggest? Briefly it is this:

That the amount of money that health insurance will cost (I believe the Haggarty figures have risen to about \$26.00 per person per year) be divided into monthly allotments and paid direct to the individual or his parent or guardian through the Family Allowances Board. Thus \$2.00 per person per month would be added to the family allowance cheque. For example, John Jones, with a wife and three infants would receive:

Family allowance	3	×	\$5.00	=	\$15.00
Sickness allowance	5	×	2.00	=	10.00
						\$25.00

We would suggest that the adolescent's sickness allowances, once they are too old for family allowances, but are still at home, continue to be added to the family allowance cheque and that this continue so long as they are at home. Even if no family allowance cheque is coming, the family's sickness allowance would continue to go to the mother or father, as it does at present, for that part of the family still at home.

We suggest, that when they leave the household, or should they desire it sooner, that sickness allowance payments could be banked by the Board for the individual provided that prompt settlement on claim is always made. Thus the young spendthrift would be establishing for himself a sickness fund.

I would, at once with children and, as soon as we have the staff, for adults, make only one requirement. We all recognize the value of periodic health examinations. I would require one such a year. Can we not ask the medical men of this country, who for many years have been patriotic enough in war to examine recruits for \$1.00, to be patriotic enough in peace to do it for \$2.00 and to give the same careful examination we did for the Army?

Such is a brief outline of sickness allowances as I see them. What are their advantages?

1. They will be a success. The success of Family Allowances assures this. They will remain a success just as long as our mothers have the moral fibre and buying ability to make Family Allowances a success. Health Insurance schemes always fail in some regard or other. Else why are they being constantly changed?

2. It is simple—an eight year old child can understand, and should be taught in school, \$2.00 per month to use for health and to treat illness. The other schemes are so complex that I doubt if the expert in Nova Scotia is familiar with what will happen in Manitoba under the obsolete schemes.

3. It has the least bureaucracy and administration any plan can have. The Family Allowance Board with their proved experience, could administer it. Thus there would be no sickness allowance bureaucrats.

4. It is democratic. The patient who has already proved his buying ability in family allowances, decides where he will buy his prevention and treatment. He does not have to remain in his district, in his province, or in his country. No centre can say that it is best equipped to treat all diseases. This scheme gives the patient who has saved his allowances, the help that no other scheme gives him, to go where he wishes for treatment, whether it be Regina or Rochester, Minn. He does not have to get anyone's permission to go. He goes. Because of this it tends to make us all in Canada improve ourselves, not only to meet competition in our own district or province, but competition from the U.S.A. You know many of your medical brothers who need improvement. This alone makes sickness allowances worth while.

5. It is flexible. Should some new method of treatment become available no government's or board's consent is required to use it. In Saskatchewan for some months the medical men treating provincial wards were limited to a formulary in their use of drug stuffs. Penicillin was in common use, but it was not mentioned in the book. On the other hand there was an opium mixture for infantile diarrhoea!

6. It is nation wide. Each Province gets the same sum, namely \$2.00 per person per month, but it goes to the patient and not to any political board. All other schemes call for individual set-ups in each Province that will vary in wisdom and efficiency between Provinces and Provincial governments as these succeed each other.

7. It avoids controversy between Provincial and Dominion governments. We are constantly hearing that the West is ill-treated, that Quebec is getting all. Under the old scheme will Manitoba be satisfied with her hospital allotment when Ontario already has her hospitals built and paid for? And so on! No question of unfairness in family allowances has been so far publicly raised by any party. This is the only plan that will avoid such endless controversy to fan the flames of disunity in Canada.

I have submitted family allowances as I see them—the only plan of assured success for medical care to all, the only truly Canadian plan and the only one without dictatorship or bureaucracy on someone's part, the only logical plan for medical care if family allowances are the success that we believe them to be. We believe that no one in public life today would care to advocate the abolition of family allowances or put any administrative restrictions upon them. Why then do we not have state medical aid by as simple and economical a method?

To the critics, I answer, if it is logical to give a young mother \$5.00 to \$8.00 per month per child for the most exacting, complicated managerial job in the world, is it not equally logical to give her \$2.00 per month per child—not more than health insurance calls for—to go to her family doctor to invest in health and to treat illness, when she has already shown her ability with family allowances, to do this?

GRIFFITH BINNING, M.B., M.D.
Medical Director of Schools,
Saskatoon.

Saskatoon,
March 18, 1946.

Penicillin Emulsion by Mouth

To the Editor:

Last year Finland *et al.* (*J. Am. M. Ass.*, 129: 315, 1945) reported good results from the use of sodium penicillin solution emulsified with aluminum hydroxide gel, given by mouth.

The results with this have been most satisfactory in my experience. The mixture was made by dissolving sodium penicillin, 100,000 units strength, in 5 drams of water. This was emulsified in 1 ounce of aluminum hydroxide gel. I used amphogel. The dosage was $\frac{1}{2}$ ounce followed by 3 drams q. 3 h.

In the instances where several in a family are or may be affected some of the emulsion can be made up and the method of preparation explained to the family and a supply of sodium penicillin (100,000 units) bottles and of the aluminum hydroxide gel left with them with an empty bottle. Then if more is needed they can prepare it themselves by stirring the penicillin solution gradually into the aluminum hydroxide gel in a cup. This is a great convenience to a farmer's family which may be 20 or more miles from a drugstore or doctor but can consult by telephone. Sometimes other treatment, such as sulfonamides, has been used as a follow-up. It is good for 2 days if at room temperature or for a month if refrigerated.

F. F. CARR-HARRIS.

Earl Grey,
Saskatchewan.

SPECIAL CORRESPONDENCE

The London Letter

(From our own correspondent)

THE NATIONAL HEALTH SERVICE BILL

Although politics and medicine may be uneasy bed-fellows, it is essential in attempting to assess the merits of the new Health Bill to appreciate the political atmosphere in which it has been introduced to Parliament. In returning the present Government to power last summer, the country indicated its assent to the Labour Party's plan for a national health service. The Government would thus have been justified in introducing a Bill based upon doctrinaire socialism and incorporating a whole-time salaried medical service. What they have done is, at the moment anyhow, far removed from this. Indeed it would not be going too far to say that the Minister of Health has gone out of his way to placate that vast majority of the profession who while willing, not to say anxious, to co-operate in a nationally organized medical service, are yet strongly opposed to becoming whole-time servants of the State. Thus, no doctor is to be compelled to enter the Service; doctors may enter the Service on a part-time basis; patients who so desire can have private wards in nationally owned hospitals, and specialists are to be allowed fees for attendance on private patients in such private wards.

To admit all this is not tantamount to approving the scheme, but in order to maintain a proper sense of perspective it is essential to appreciate this background against which the Bill must be assessed.

SOME CRITICISMS OF THE BILL

So far as the profession is concerned the main criticism of the Bill is that it is lacking in balance, imposing unnecessary rigidity in certain aspects and in other aspects failing to provide adequate correlation. As the council of the B.M.A. point out, for instance, there is no adequate correlation between the Hospital and Specialists Service, the General Practitioner's

Service, and the Local Health Authorities Service. The hospitals are to be under the control of Regional Boards, while the "family doctor service", as it is known, is the responsibility of entirely separate bodies known as Executive Councils, but the Health Centres in which family doctors are to work are to be owned by local authorities. To complicate matters still further, maternity and child welfare clinics and maternity and health visitors are to be the responsibility of these local health authorities. To take a concrete, and by no means fanciful, case, one will have the spectacle of a pregnant woman with a boil, for instance, attending a health centre in which she will go to her own doctor for treatment of her boil, but will have to go to another room in the centre to attend the ante-natal clinic run by the local health authority.

If we are to have a national service, then it is incumbent that it should be carefully integrated so that there shall be no overlapping, and that, starting with the family doctor, it will be possible to bring to every patient all the facilities of modern medicine, surgery and midwifery.

THE UNIVERSITIES AND THE BILL

One of the great merits of the Bill is the relatively high degree of independence left to the teaching hospitals. These have been placed in a category by themselves, and as the regional control of the hospitals is to be based upon them, this should go far towards maintaining the standard of medical practice. The responsibility for the teaching hospitals is thus great, but if they rise to the occasion, there is probably little to fear regarding the future.

The other integral feature of the Bill, upon which much depends is the Central Health Services Council which is to be set up "to advise the Minister upon such general matters relating to the services provided under this Act as they think fit and upon any questions referred to them by him relating to those services". The vital point here is that the Council can raise matters upon their own initiative, and not merely wait until matters are brought before it by the Minister. As the medical membership of the Council will constitute a

majority of the 41 members and include the Presidents of the three Royal Colleges and the chairman of the council of the B.M.A., there should be ample safeguard here against political interests playing an excessive part in the development of the scheme.

FINANCE

There has been considerable criticism of the proposal to pay participating doctors by means of a basic salary plus capitation fees, the former being seen as the first step towards a whole-time salaried service. The reason given for making use of a fixed part-salary is that this will make it possible to take account of "different circumstances and experience and the differing conditions of practice in particular areas". Actual rates of remuneration have not yet been determined; this awaits the report of a special committee which has been investigating the matter and has not yet reported.

WILL THE SCHEME WORK?

Given goodwill on both sides, the answer to this question is in the affirmative. The pill may be a bitter one, but Mr. Bevan has sugared it well. It may well be the thin edge of the wedge, but first impressions are that with our national genius for compromise it should be possible to evolve a national health service of which both the country and the profession will have every reason to be proud. The means chosen may not be those that would have been adopted by the bulk of the medical profession, but with mutual understanding and co-operation they should prove workable.

What requires to be emphasized is that the criticisms of the Bill advanced by the profession through the medium of the B.M.A. are not based upon a mere desire to obstruct reform. The profession has every intention of making the best of whatever form the national service may ultimately take, but while the scheme is in the formative stage it rightly feels that its prime duty is to do everything possible to amend it along the lines which are considered most likely to bring the maximum benefit to the citizens of the country.

WILLIAM A. R. THOMSON.

London, April, 1946.

CANADIAN MEDICAL WAR SERVICES

MEDICAL OFFICERS APPOINTED TO THE R.C.A.M.C. — ACTIVE FORCE

FEBRUARY 1946

(Previous sections in January, March, April, May, June, July, September, October, November and December, 1945 and January, March, 1946.)

SECTION LXVIII

Name and Address	Date of Appointment	Name and Address	Date of Appointment
Barclay, W. R., 60 West 12th Ave., Vancouver	6-1-46	Hugill, J. T., 11154-83rd Ave., Edmonton	6-1-46
Beauchamp, L. E., 9904-113 St., Edmonton	6-1-46	Hutton, G. L. (no address known)	1-1-46
Bennett, W. L. L., 9622-105 St., Edmonton	6-1-46	Johnston, R. J., No. 5, 10964-84th Ave., Edmonton	6-1-46
Boileau, G. R., 11407-100 Ave., Edmonton	6-1-46	Jones, G. W., 1383 West 32 Ave., Vancouver	1-2-46
Boorman, G. C., 10932-87 Ave., Edmonton	6-1-46	Key, Chapin, 10956-84th Ave., Edmonton	6-1-46
Bradshaw, A. K., 8621-108A St., Edmonton	6-1-46	Kidd, E. G., 10930-87th Ave., Edmonton	6-1-46
Campbell, G. M., 11035-87 Ave., Edmonton	6-1-46	Kozak, P. E., Bruno, Sask.	6-1-46
Christie, R. G., Royston, B.C.	6-1-46	Livingstone, A. G., Waskatenau, Alta.	6-1-46
Corbet, R. C. B., 10437 Saskatchewan Dr., Edmonton	6-1-46	McCrum, J. R., 8703-112 St., Edmonton	6-1-46
Edwards, L. H., Three Hills, Alta.	6-1-46	McDonald, J. A., 6550 Union St., Lochdale, Vancouver	8-1-46
Freeman, V. J., 1235 West 26th Ave., Vancouver	22-2-46	MacEwan, W. R., 6544 Balsam St., Vancouver	28-1-46
Green, Kenwood, Box 583, Prince Rupert, B.C.	6-1-46	MacKinnon, H. N., 1621-17A St. East, Calgary	6-1-46
Grisdale, L. C., 156 Carling Ave., Ottawa	1-1-46	Marfleet, T. L., Marwayne, Alta.	6-1-46
Guild, Julius, 10632-103 St., Edmonton	6-1-46	Marshall, M., Taber, Alta.	6-1-46
Hartford, J. J., 1621 Salisbury St., Vancouver	1-2-46	Metcalfe, J. O., 6 Stratheona Court, Lethbridge, Alta.	6-1-46
Hay, M. C., Foxwarren, Man.	1-2-46		

Name	Address	Date of appointment	Name	Address	Date of appointment
Myers, H. A.	805-8th Ave., Calgary	10-2-46	Trott, A. W. J.	99-38 108th St., Edmonton	6-1-46
Patten, C. G.	966 W. 12th Ave., Vancouver	5-3-46	Tysoe, F. W.	R.M.D. 4, Victoria, B.C.	6-1-46
Rice, D. A.	1280 4th Ave. S., Lethbridge, Alta.	6-1-46	Van Kleeck, W. M.	Armstrong, B.C.	15-1-46
Skwarok, E. W.	9948-88th Ave., Edmonton	1-2-46	Wiggins, R. L.	11015-88th Ave., Edmonton	6-1-46
Sleath, G. E.	4324 Ledger St., New Westminster, B.C.	6-1-46	Wilson, G. B.	138 West 21 St., North Vancouver	2-3-46
Smith, G. L.	Windermere, B.C.	6-1-46	Winsor, H. C.	1094 Randolph Ave., St. Paul, Minn., U.S.A.	1-3-46
Swallow, K. A.	10504-127 Street, Edmonton	6-1-46			

MEDICAL OFFICERS STRUCK OFF STRENGTH OF THE R.C.A.M.C.—ACTIVE FORCE

FEBRUARY 1946

SECTION LXIX

Name	Address	Date struck off strength	Name	Address	Date struck off strength
Adams, S. T.	4333 Westmount Ave., Westmount, Que.	7-1-46	Doyle, A. M.	Ontario Hospital, Kingston, Ont.	30-1-46
Agro, C. F.	231 Park St. N., Hamilton, Ont.	16-1-46	Duggan, H. E.	Red Deer, Alta.	15-1-46
Albert, J. P.	Notre Dame Hospital, Montreal.	30-1-46	Dunton, A. S.	138 Grand River St. N., Paris, Ont.	17-1-46
Allan, M. L.	2104 W. 37th Ave., Vancouver.	19-12-45	Dymond, M. B.	Box 189, Port Perry, Ont.	28-1-46
Anderson, R. E. C.	Ashton, Ont.	18-1-46	Eaton, R. B.	8 Rupert St., Amherst, N.B.	14-11-45
Angers, Benoit	241 Racine, Chicoutimi, Que.	29-1-46	Edwards, P. A.	McGill University, Montreal	21-1-46
Archibald, W. S.	305 McLeod Bldg., Edmonton.	19-1-46	Egan, C. F.	562 Johnston St., Kingston, Ont.	17-11-45
Arthurs, R. G. S.	501 West Georgia St., Vancouver.	16-1-46	Epstein, A. A.	P.O. Box 454, New Waterford, N.S.	15-1-46
Balfour, J. D.	333 Queen's Ave., London, Ont.	14-1-46	Evans, E. M.	91 Borebank St., Winnipeg	31-1-46
Barclay, L. T.	Toronto.	21-12-45	Evans, S. E.	1089 Richelieu Ave., Vancouver	16-1-46
Bashow, L. E.	Liverpool, N.S.	12-1-46	Ferguson, C. G.	Central Y.M.C.A., College St., Toronto	24-1-46
Beattie, J. H.	Clinton, Ont.	15-1-46	Fielden, E. C.	758 Mt. Pleasant Rd., Toronto	17-1-46
Bell, Robert	Bala, Ont.	19-1-46	Finklestein, W. E.	396 Oliver Ave., Westmount, Que.	23-1-46
Benaron, Tully	Sanitorium, Fort William, Ont.	24-1-46	Fraser, G. M.	418 Dougal St., Peterborough, Ont.	18-1-46
Bennett, W. J.	No. 12 Newhaven Apts., Winnipeg.	4-1-46	Fremes, I. A.	3755 St. Catherine St., Montreal	10-1-46
Blair, N. J.	175 Parkview St., St. James, Man.	21-1-46	Gendreau, L. P.	Eveline St., Selkirk, Man.	5-1-46
Bolley, Hildo	192 Roxton Rd., Toronto.	18-1-46	Gilbert, J. A. L.	22 Strathearn Rd., Edinburgh	22-12-45
Boucher, H. T.	1291 Devonshire Cres., Vancouver.	1-12-45	Graham, G. A.	Alliston, Ont.	25-1-46
Boyd, T. A. B.	Newmarket, Ont.	12-1-46	Griffin, J. D. M.	111 St. George St., Toronto	13-9-45
Bramley-Moore, William	10621-83rd Ave., Edmonton	10-1-46	Gross, R. C.	43 Woodlawn Ave., Ottawa	15-1-46
Breslin, W. I.	405 Dundas St. W., Toronto.	9-1-46	Grossman, A. A.	5565 Dunmore Ave., Montreal	10-1-46
Brook, Joseph	Saskatoon.	8-11-45	Guimont, J. E.	Port Rouge Co., Portneuf, Que.	22-1-46
Burris, S. M.	704 Henderson Highway, Winnipeg.	25-1-46	Gurd, F. N.	61 Oakland Ave., Westmount, Que.	15-1-46
Byrne, U. P.	Essondale, B.C.	4-1-46	Hall, J. G.	240 Wonham St., Ingersoll, Ont.	25-1-46
Cahoon, E. B.	215 College St., Apt. 237, Toronto.	16-1-46	Halpenny, G. W.	1414 Drummond St., Montreal	30-1-46
Cass, I. M.	467 Queen St. W., Toronto.	12-1-46	Hamilton, J. D.	378 Davenport Rd., Toronto	14-12-45
Caverhill, M. R.	625 Fort Street, Victoria.	8-1-46	Hardyment, A. F.	524 Elbow Dr., Calgary	15-1-46
Chamberlain, J. H.	195 Montrose St., Winnipeg.	16-1-46	Hassard, F. R.	1361 King St. W., Toronto	10-1-46
Chesney, L. P.	4970 Cote des Neiges Rd., Montreal.	8-1-46	Hazen, J. S.	61 Breadalbane St., Toronto	31-1-46
Civkin, S. W.	304 College Ave., Winnipeg.	28-1-46	Hevey, Georges	Montreal	10-1-46
Cleghorn, R. A.	22 Brendan Rd., Toronto.	3-10-45	Hill, J. C.	68 South Drive, Toronto	16-1-46
Cockcroft, W. H.	53 Stanley St., Mimico, Ont.	25-1-46	Holland, T. E.	80 Brock St., Winnipeg	23-1-46
Cohen, William	3595 Famille St., Montreal.	11-1-46	Holloway, R. W.	St. Boniface Hospital, St. Boniface, Man.	11-12-45
Cook, N. C.	555 Newport Ave., Victoria.	15-1-46	Hudson, J. E.	405 Broadway Ave., Winnipeg	29-1-46
Craft, George	Outremont, Que.	14-1-46	Hume, W. E.	70 Court St., Sherbrooke, Que.	18-1-46
Craig, K. L.	3708 Dundas St., Vancouver	5-1-46	Hurlburt, F. W. B.	Toronto General Hospital, Toronto	8-1-46
Crosby, C. H.	Montreal General Hospital, Montreal	11-1-46	Hyndman, C. F.	Montreal General Hospital, Montreal	8-1-46
Curry, B. H. G.	49 Rochester Ave., Toronto	23-1-46	Johnson, L. G.	4A Grove St., Boston, Mass., U.S.A.	23-1-46
Curts, F. W.	177 Rosewell Ave., Toronto	10-1-46	Johnston, G. C.	4229 Osler St., Vancouver	26-11-45
Davidson, D. A.	Cartwright, Man.	17-1-46	Kaufman, Nathan	82B St. Louis St., Lachine, Que.	7-1-46
Davidson, J. R.	6037 Marguerite St., Vancouver	3-1-46	Kenner, H. B.	325 St. David St., Stratford, Ont.	16-1-46
Dawson, H. S.	Toronto	30-1-46	Kenning, S. G.	896 Dareen Place, Victoria	11-1-46
Derby, A. C.	4029 Hampton Ave., Montreal	16-1-46	Kerster, G. G.	Kincaid, Sask.	12-1-46
Dewar, F. P.	Toronto General Hospital, Toronto	4-1-46	Kinnaird, F. A.	Russell, Ont.	16-1-46
Dickey, M. R.	910 Queen St., Saskatoon	13-12-45	Klass, A. A.	132 Matheson Ave., Winnipeg.	10-12-45
Dixon, T. P.	70 Cedar St., Sudbury, Ont.	1-2-46			

Name	Address	Date struck off strength	Name	Address	Date struck off strength
Kobrinisky, M. T., 5 St. John's Ave., Winnipeg.		3-11-45	Quinlan, J. J., 220 Cambrai St., Stratford, Ont.		11-1-46
Kulesar, Desider, 63 Sherbrooke St. E., Montreal.		7-1-46	Rabinowitz, Paul, Mountain Sanatorium, Hamilton, Ont.		10-1-46
Lackner, H. A., 50 Margaret Ave., Kitchener, Ont.		3-1-46	Rae, J. M., North North Battleford, Sask.		22-1-46
Landry, R. D., Buctouche, N.B.		17-1-46	Rafuse, E. R., Meadow Lake, Sask.		7-1-46
Laurie, J. I. H., (No address known).		24-1-46	Ramsay, C. N., Chillocothe Rd., Aurora, Ohio, U.S.A.		31-1-46
Leddy, J. E., c/o 32 Humberview Rd., Toronto.		21-12-45	Rockel, A. C., New Dundee, Ont.		14-1-46
Lee, H. H., 90 William St., Stratford, Ont.		12-1-46	Rogers, R. M., West Hill, Ont.		10-1-46
Lerner, Maxwell, 558 Alfred Ave., Winnipeg.		29-1-46	Ross, C. C., 406 Regent St., London, Ont.		17-1-46
Lewis, H. W., Battleford, Sask.		22-1-46	Ross, H. M., 17 Barber Ave., Guelph, Ont.		15-1-46
Lewis, R. R., 4679 Esplanade Ave., Montreal.		10-1-46	Rothwell, J. C., 140 Maple Ave., Quebec		31-1-46
Lloyd, H. H., Chesterville, Ont.		21-1-46	Rowland, W. A., 39 Heather Rd., Leaside, Ont.		21-1-46
Loadman, B. E., 665 Elgin Ave., Winnipeg.		7-1-46	Rusen, S. D., 107 Hallett St., Winnipeg		21-11-45
Love, J. W., 220-6th Ave. E., Calgary		30-1-46	Russell, T. F., St. David St., Fergus, Ont.		12-1-46
MacArthur, F. C., 160 Robie St., Halifax.		7-1-46	Ruston, F. G., 35 West Ave., North Hamilton, Ont.		9-1-46
McCabe, John, (No address known).		14-1-46	Schneiderman, Clarence, 470 Ville Neuve W., Montreal		9-1-46
McCormack, C. W., Renfrew, Ont.		11-10-45	Schumm, B. J., 206 King St., Waterloo, Ont.		19-1-46
MacDonald, C. J., 74 Jubilee Rd., Halifax.		11-1-46	Shier, J. W., 1775 Blanca St., Vancouver		16-1-46
McDonald, W. O., 38 Coburg St., Saint John, N.B.		24-1-46	Shipp, F. L., 211 Glenayr Rd., Forest Hill Village, Ont.		4-1-46
McDougall, J. W., 35 Garden St., Brockville, Ont.		4-1-46	Simard, J. P. A., 25 Charlevoix St., Quebec		15-12-45
MacFarlane, J. W., 28 Duke St., Hamilton, Ont.		11-1-46	Skulsky, Hyman, 1770 Clifton Ave., Moose Jaw, Sask.		16-1-46
McGill, W. L. C., 43 Dorval Rd., Toronto.		2-11-45	Slade, H. C., Miller Town, Newfoundland		29-1-46
McGowan, T. P., Trochu, Alta.		23-10-45	Smith, G. G., 46 Buckingham Ave., Toronto		9-1-46
MacKay, A. M., 140 Temperance St., New Glasgow, N.S.		21-12-45	Sniderman, Samuel, 460 Main St. E., Hamilton, Ont.		30-1-46
McKay, C. O., 64 Charlotte St., Saint John, N.B.		16-1-46	Spence, J. M., 1185 Avenue Rd., Toronto		21-1-46
MacKenzie, J. C., 4689 Upper Roslyn Ave., Montreal.		31-1-46	Stern, L. G., 376 Redfern Ave., Westmount, Que.		17-1-46
MacLaren, R. D., Whitby, Ont.		21-12-45	Stevenson, W. D., 111 St. Clair Ave., Hamilton, Ont.		18-1-46
MacLean, D. L., 142 George St., Toronto.		23-1-46	Stewart, A. J., 1531 Davie St., Vancouver		18-12-45
MacLean, I. S., 67 Middlegate, Winnipeg.		5-1-46	Stoker, G. L., 1071 East 51st Ave., Vancouver		16-1-46
McMillen, N. E. J., 268 Cromwell St., Sarnia, Ont.		18-1-46	Stull, G. H. D., 352 Barton St. E., Hamilton, Ont.		18-1-46
McMurtry, T. S. G., Vancouver Gen. Hosp., Vancouver.		9-1-46	Sugarman, Harold, 728-9th Ave., Saskatoon		10-1-46
MacNeil, C. H., P.O. Box 45, Campbellford, Ont.		20-11-45	Sumner, W. G., London, Ont.		18-1-46
MacPherson, J. C., Didsbury, Alta.		2-2-46	Taylor, W. I., Cannington, Ont.		16-1-46
Magladery, J. W., 2 Sultan Ave., Toronto.		9-1-46	Thomson, J. A. C., 8 Wilberton Rd., Toronto.		23-11-45
Maley, S. C., Brandon, Man.		19-1-46	Tiliman, W. A., 612 Richmond St., London, Ont.		18-1-46
Manly, C. C. Sandy Lake, Manitoba.		11-1-46	Tisdale, R. W., Delhi, Ont.		17-1-46
Markham, J. D., 1306 Ridgeway St., Fort William, Ont.		17-1-46	Toone, W. M., 2426 Bellevue Ave. W., West Vancouver.		16-1-46
Marwood, L. R., 378 Fairlawn Ave., Toronto		16-1-46	Traynor, J. A., 2823 Victoria Ave., Regina.		8-12-45
Meltzer, Herbert, Manitoba Sanatorium, Ninette, Man.		7-11-45	Trotter, M. C., Collingwood, Ont.		7-1-46
Mendelson, H. I., 237 St. Joseph Blvd. W., Montreal		14-1-46	Turner, W. P., 196 William St., Ottawa.		4-1-46
Mesbur, B. J., 3316 Victoria Ave., Regina		24-1-46	Tuttle, M. J., 528-8th St. S., Lethbridge, Alta.		23-1-46
Middlebro, J. P., 1025-2nd Ave. W., Owen Sound, Ont.		18-1-46	Van Wyck, Norman, 621 Belmont Ave., Westmount, Que.		25-1-46
Mitchell, Jack, Box 428, Maple Creek, Sask.		8-1-46	Veniot, L. M., 10 King St., Bathurst, N.B.		12-1-46
Monks, H. T. J., Montreal		11-1-46	Voloshin, P. C., 117-Ave. P. South, Saskatoon.		8-1-46
Morehouse, O. E., Upper Keswick, N.B.		9-1-46	Voyer, Victorin, St. Alexandre, Kamouraska Co., Que.		17-1-46
Morin, P. G., Causapsal St., Quebec		16-1-46	Walker, J. E., 301 Vancouver Blk., Vancouver.		16-1-46
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Plewes, F. B., 34 Fairview Blvd., Toronto		24-1-46	Worrell, J. C., 115 Victoria Rd., Halifax.		8-1-46
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Procunier, F. A., Lucknow, Ont.		9-1-46	Zinkann, R. W. J., 737 W. King St., Kitchener, Ont.		14-1-46

SECTION LXX

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Date of death

19-1-46

Killed in Action

MacDonald, W. K., Ottawa

5-8-43

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Since there is a long incubation period the causation of homologous serum jaundice may be overlooked and the disease labelled infectious hepatitis. Its relatively frequent occurrence after plasma transfusion is due to the pooling of many sera, only 0.1 c.c. of icterogenic serum being required for transference of the disease. The hazard of hepatitis is greater, therefore, with the use of pooled plasma than with whole blood from a single donor. Ultra-violet irradiation has been reported as a means of destruction of the icterogenic agent in plasma and this may prove to be a method of prevention.

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A series of 90 cases is reviewed. In 85% of these there existed infection about the mouth, considered to be of etiological importance as the initiating factor in anaerobic lung infection which precedes the pleural involvement. A preceding history of long continued cough with foul sputum is common as is the presence of severe, localized chest pain and tenderness. The physical signs are those of fluid. The temperature is low in comparison with the pulse rate and the patient early becomes delirious and toxic. Cellulitis of the chest wall is a frequent and very serious complication (21% of present series) and for this reason repeated aspirations are to be avoided and operative drainage should quickly follow the diagnostic thoracentesis.

Even though the fluid tends to remain thin fixation of the mediastinum occurs early. If, at the time of operation, the pleura is not thickened and a small incision through it reveals non-fixation of the mediastinum, the incision is quickly enlarged and immediately covered with a pad previously prepared. This pad quickly becomes saturated with exudate and acts as a tampon, being left in place for three days. If the mediastinal fixation is adequate pus and fibrin are removed by suction. A gauze pack, impregnated with activated zinc peroxide, is placed partly in the pleural

Name	Address	Date struck off strength	Name	Address	Date struck off strength
Kobrinisky, M. T., 5 St. John's Ave., Winnipeg.		3-11-45	Quinlan, J. J., 220 Cambrai St., Stratford, Ont.		11-1-46
Kulcsar, Desider, 63 Sherbrooke St. E., Montreal.		7-1-46	Rabinowitz, Paul, Mountain Sanatorium, Hamilton, Ont.		10-1-46
Lackner, H. A., 50 Margaret Ave., Kitchener, Ont.		3-1-46	Rae, J. M., North North Battleford, Sask.		22-1-46
Landry, R. D., Buctouche, N.B.		17-1-46	Rafuse, E. R., Meadow Lake, Sask.		7-1-46
Laurie, J. I. H., (No address known).		24-1-46	Ramsay, C. N., Chillicothe Rd., Aurora, Ohio, U.S.A.		31-1-46
Leddy, J. E., c/o 32 Humberview Rd., Toronto.		21-12-45	Rockel, A. C., New Dundee, Ont.		14-1-46
Lee, H. H., 90 William St., Stratford, Ont.		12-1-46	Rogers, R. M., West Hill, Ont.		10-1-46
Lerner, Maxwell, 558 Alfred Ave., Winnipeg.		29-1-46	Ross, C. C., 406 Regent St., London, Ont.		17-1-46
Lewis, H. W., Battleford, Sask.		22-1-46	Ross, H. M., 17 Barber Ave., Guelph, Ont.		15-1-46
Lewis, R. R., 4679 Esplanade Ave., Montreal.		10-1-46	Rothwell, J. C., 140 Maple Ave., Quebec		31-1-46
Lloyd, H. H., Chesterville, Ont.		21-1-46	Rowland, W. A., 39 Heather Rd., Leaside, Ont.		21-1-46
Loadman, B. E., 665 Elgin Ave., Winnipeg.		7-1-46	Rusen, S. D., 107 Hallett St., Winnipeg		21-11-45
Love, J. W., 220-6th Ave. E., Calgary		30-1-46	Russell, T. F., St. David St., Fergus, Ont.		12-1-46
MacArthur, F. C., 160 Robie St., Halifax.		7-1-46	Ruston, F. G., 35 West Ave., North Hamilton, Ont.		9-1-46
McCabe, John, (No address known).		14-1-46	Schneiderman, Clarence, 470 Ville Neuve W., Montreal		9-1-46
McCormack, C. W., Renfrew, Ont.		11-10-45	Schumm, B. J., 206 King St., Waterloo, Ont.		19-1-46
MacDonald, C. J., 74 Jubilee Rd., Halifax.		11-1-46	Shier, J. W., 1775 Blanca St., Vancouver		16-1-46
McDonald, W. O., 38 Coburg St., Saint John, N.B.		24-1-46	Shipp, F. L., 211 Glenayr Rd., Forest Hill Village, Ont.		4-1-46
McDougall, J. W., 35 Garden St., Brockville, Ont.		4-1-46	Simard, J. P. A., 25 Charlevoix St., Quebec		15-12-45
MacFarlane, J. W., 28 Duke St., Hamilton, Ont.		11-1-46	Skulsky, Hyman, 1770 Clifton Ave., Moose Jaw, Sask.		16-1-46
McGill, W. L. C., 43 Dorval Rd., Toronto.		2-11-45	Slade, H. C., Miller Town, Newfoundland		29-1-46
McGowan, T. P., Trochu, Alta.		23-10-45	Smith, G. G., 46 Buckingham Ave., Toronto		9-1-46
MacKay, A. M., 140 Temperance St., New Glasgow, N.S.		21-12-45	Sniderman, Samuel, 460 Main St. E., Hamilton, Ont.		30-1-46
McKay, C. O., 64 Charlotte St., Saint John, N.B.		16-1-46	Spence, J. M., 1185 Avenue Rd., Toronto		21-1-46
MacKenzie, J. C., 4689 Upper Roslyn Ave., Montreal.		31-1-46	Stern, L. G., 376 Redfern Ave., Westmount, Que.		17-1-46
MacLaren, R. D., Whitby, Ont.		21-12-45	Stevenson, W. D., 111 St. Clair Ave., Hamilton, Ont.		18-1-46
MacLean, D. L., 142 George St., Toronto.		23-1-46	Stewart, A. J., 1531 Davie St., Vancouver		18-12-45
MacLean, I. S., 67 Middlegate, Winnipeg.		5-1-46	Stoker, G. L., 1071 East 51st Ave., Vancouver		16-1-46
McMillen, N. R. J., 268 Cromwell St., Sarnia, Ont.		18-1-46	Stull, G. H. D., 352 Barton St. E., Hamilton, Ont.		18-1-46
McMurtry, T. S. G., Vancouver Gen. Hosp., Vancouver.		9-1-46	Sugarman, Harold, 728-9th Ave., Saskatoon		10-1-46
MacNeil, C. H., P.O. Box 45, Campbellford, Ont.		20-11-45	Sumner, W. G., London, Ont.		18-1-46
MacPherson, J. C., Didsbury, Alta.		2-2-46	Taylor, W. I., Cannington, Ont.		16-1-46
Magladery, J. W., 2 Sultan Ave., Toronto.		9-1-46	Thomson, J. A. C., 8 Wilberton Rd., Toronto.		23-11-45
Maley, S. C., Brandon, Man.		19-1-46	Tiliman, W. A., 612 Richmond St., London, Ont.		18-1-46
Manly, C. C. Sandy Lake, Manitoba.		11-1-46	Tisdale, R. W., Delhi, Ont.		17-1-46
Markham, J. D., 1306 Ridgeway St., Fort William, Ont.		17-1-46	Toone, W. M., 2426 Bellevue Ave. W., West Vancouver.		16-1-46
Marwood, L. R., 378 Fairlawn Ave., Toronto		16-1-46	Traynor, J. A., 2823 Victoria Ave., Regina.		8-12-45
Meltzer, Herbert, Manitoba Sanatorium, Ninette, Man.		7-11-45	Trotter, M. C., Collingwood, Ont.		7-1-46
Mendelson, H. I., 237 St. Joseph Blvd. W., Montreal		14-1-46	Turner, W. P., 196 William St., Ottawa.		4-1-46
Mesbur, B. J., 3316 Victoria Ave., Regina		24-1-46	Tuttle, M. J., 528-8th St. S., Lethbridge, Alta.		23-1-46
Middlebro, J. P., 1025-2nd Ave. W., Owen Sound, Ont.		18-1-46	Van Wyck, Norman, 621 Belmont Ave., Westmount, Que.		25-1-46
Mitchell, Jack, Box 428, Maple Creek, Sask.		8-1-46	Veniot, L. M., 10 King St., Bathurst, N.B.		12-1-46
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Muir, J. A., Port Hawkesbury, N.S.		23-1-46	Walters, F. H., 320 Regent St., London, Ont.		19-1-46
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SECTION LXX

<i>Died in Canada</i>	<i>Date of death</i>
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cavity and partly in the wound and in five to seven days the incision is clean and granulating. Tubes are then inserted as for an ordinary empyema.

The authors stress the importance of avoidance of closed thoracotomy or the suture of the wound after rib resection and the value of zinc peroxide.

NORMAN S. SKINNER

The Early Diagnosis of Minimal Pulmonary Tuberculosis. Bobrowitz, I. D. and Dwork, R. E.: *New England J. Med.*, 234: 10, 1946.

A study was made of 200 consecutive cases of minimal tuberculosis admitted to sanatorium in an effort to determine factors which would aid in early diagnosis. It was evident that age, occupation, social and economic background were of no importance in etiology. A positive history of contact with the disease was obtained in only 34%. Symptoms were present in 82% of the patients but these were frequently mild and not suggestive of pulmonary disease. Physical findings were proved to be of minor importance in diagnosis, only 29% presented râles. The sedimentation rate was normal in 56% and the white blood count was even less important in indicating activity.

X-ray examination of the chest is the only reliable method of detecting early pulmonary tuberculosis and should be carried out in every case with suggestive symptoms, in any illness which conceivably might be tuberculosis, periodically in all contacts and as a routine for the entire population since case-finding studies of large groups of people by this method reveal unsuspected active tuberculosis in about 1%.

NORMAN S. SKINNER

Infectious Mononucleosis: A Clinical Study of Sixty-three Cases. Kruger, A. L., et al.: *Ann. Int. Med.*, 23: 945, 1945.

Infectious mononucleosis is a relatively benign disease with protean manifestations. Every case of pharyngitis or tonsillitis which does not respond in four or five days to symptomatic therapy, and especially if associated with adenopathy, should be investigated for the possibility of infectious mononucleosis. The diagnosis should also be considered in every case with unexplained fever, lymphadenopathy and splenomegaly. Early in the disease there may be a normal differential count or even a polynucleosis. The heterophile antibody test may not become positive until later in the illness. Blood smears and heterophile antibody tests should be repeated, if negative at the onset, at intervals of three or four days in all suspected cases.

Therapy is symptomatic with rest in bed during the febrile period.

S. R. TOWNSEND

Surgery

Early Ambulation Following Surgery. Spang, A. J. and Spang, J. S.: *Am. J. Surg.*, 71: 316, 1946.

Early rising after surgery has long been practised in the case of children and animals. The aged have been encouraged to get up as soon as possible to avoid cardiovascular and pulmonary complications. Many of the troubles that follow abdominal section are related to bed rest: atelectasis, hypostatic pneumonia, intestinal distension, venous thrombosis with embolism and infarction.

A series of 150 appendectomies, allowed up as soon as the patient wishes, is compared with a series of the same number, kept in bed for the traditional week. The length of hospitalization was less: 5.5 days compared to 9.8. Sedative hypodermics were fewer: 3.7 to 5.9. Catheterizations averaged 1.3 instead of 2.3. The time confined to bed was 2.3 days compared to 7.3.

In 15 herniorrhaphies out of bed by the third day after operation and out of hospital within a week, there were no recurrences, convalescence was more comfortable and work was resumed earlier.

Case histories of patients who were up soon after cholecystectomy, hysterectomy, Manchester repair, appendectomy, and gastrectomy for jejunal ulcer, are given in detail. Wounds were closed accurately with non-absorbable sutures. The absence of postoperative fever, asthenia, and gastrointestinal complications is noted. Often the patient coughed up a mucous plug the first time he got out of bed. In brief, patients like it: morale is higher.

BURNS PLEWES

Free Grafts of Skin and Cartilage from the Ear.

Brown, J. B. and Cannon, B.: *Surg., Gyn. & Obst.*, 82: 253, 1946.

The authors have used grafts composed of two layers of skin with intermediate cartilage from the ear to repair defects in the nose, stressing that this method gives the best cosmetic effect so far attainable. In regard to the recipient area, there must be good minute blood supplies obtained by enlarging the defect. As far as the donor area is concerned, repairs may be from immediate closure of the defect using the structures of hands or from transfer of nearby skin. The graft is sewed accurately in place with fine sutures along all edges with one or two deep ones at the start.

In summary, sections of the border of the ear containing two surfaces of skin with cartilage in between have been successfully transplanted as free grafts and the defects of the nostril border to the columella have been repaired satisfactorily in a single operation.

L. T. BARCLAY

The Treatment of Burns. Bornemeier, W. C. and Parsons, L.: *Surg., Gyn. & Obst.*, 82: 1946.

A series of 155 burn patients is analyzed and there is a short discussion on the classifications of burns one to three. Debridement was of the simplest, consisting of soap and water cleansing of the burned areas, following which plasma was given intravenously at the rate of 50 c.c. for each 1% of body burns. Topical application was fine mesh gauze over a non-irritating emollient with a pressure dressing and the dressings were changed not oftener than every seven to ten days and then only under the strictest aseptic precautions in the operating room. The dressing was usually done under sodium pentothal but in a few more extensive cases of skin graft, gas anaesthesia was used. It was the author's impression that the patients did less well under the latter anaesthetic.

It is necessary to skin graft early, for the longer this is delayed, the greater the problem of infection and supportive therapy. In all, 26 patients averaging 20% of body surface burns required skin grafting. This was done in 14 to 21 days when the eschar was well defined and beginning to loosen; it was removed by dissection. In many cases, grafting had to be done in stages and these followed each other at intervals of about four days. Grafts were usually cut freehand except where thicker grafts were required over flexor surfaces. The authors make a point of avoiding contact of the graft with saline in the course of transfer to its permanent site and no effort is made to keep donor and recipient areas separate. They depend on its own adhesive substance to fix the graft to its new location, and the dressings, which include plaster of paris casts on the extremities.

No chemotherapy was required except in third degree burns when the patients were given either sulfonamide or penicillin.

L. T. BARCLAY

Obstetrics and Gynecology

The Relation of the Theca-Cells to Disturbances of the Menstrual Cycle. Culliner, A.: *J. Obst. & Gyn. Brit. Emp.*, 52: 545, 1945.

Theca-cell proliferation may occur as part of the maturation process in the Graafian follicle. Theca-cell luteinization around atretic follicles may without clinical significance in ovulatory cycles, but are nevertheless a

part of the normal atretic process. Luteinized theca-cells exert an endocrine influence, the precise nature of which is as yet undetermined. The formation of extensive areas of lutein theca-cells may be visible microscopically and appear as pale yellow masses or plaques usually associated with atretic or cystic follicles which, however, may not be readily apparent. Luteinization of theca-cells may be localized to small areas and, consequently, serial sections of ovaries may be necessary to determine the presence of luteinized theca-cells. In the presence of extensive theca luteinization associated with follicular atresia, disturbances of menstrual rhythm and bleeding may ensue. The term "Corpus thecale luteum" has been suggested for the thecal proliferation occurring in association with follicular atresia, and a classification for the types of these reactions has been proposed. The character of the uterine reactions associated with theca-cells is such that neither oestrogenic nor progestogenic influences can be attributed to them. Their activity suggests the formation of a third ovarian hormone which may exert androgenic activity, or of a modified secretion of the known varieties which is capable of distorting the balance between simultaneously acting steroid hormones of the menstrual cycle. The relation of these structures to theca-cell tumours has been briefly reviewed.

P. J. KEARNS

Blood-Pressure of Relatives of Patients with Toxæmia of Late Pregnancy. Barnes, J. and Browne, F. J.: *J. Obst. & Gyn. Brit. Emp.*, 52: 559, 1945.

It is well known that a tendency to high blood-pressure may be inherited though the evidence for this is based on records of individual families rather than on statistical study. Many individual reports have appeared of the occurrence of eclampsia in several members of the same family. A tendency to hypertensive disease in relatives of patients suffering from eclampsia and pregnancy toxæmia has also been noted. The blood-pressure has been recorded in 226 relatives of 129 patients who were admitted to hospital with pregnancy toxæmia. These patients have been divided into 4 groups: eclampsia, pre-eclamptic toxæmia, essential hypertension and pregnancy, and unclassified toxæmia. The blood pressure was also estimated in 66 relatives of 47 control patients who were not suffering from toxæmia. A demonstrable difference in the levels of blood-pressure has not been noted between the relatives of toxæmic and control patients, except in cases of essential hypertension and pregnancy. Here it was found that 16 among 18 mothers of the patients in this group were markedly hypertensive. It is concluded that there is not any evidence that a hereditary tendency to hypertension is of any general importance in the etiology of toxæmia of pregnancy except in cases of essential hypertension and pregnancy. The implication of these findings are briefly discussed, and it is concluded that it is rarely necessary to interrupt pregnancy in a case of essential hypertension in the interests of the mother. Nor should patients with a family history of hypertensive cardiovascular disease be discouraged from having children, except in those very rare cases in which the manifestations of the disease have occurred frequently and at an early age.

P. J. KEARNS

The Prevention of Premature Labour. Shute, W. and Shute, E.: *J. Obst. & Gyn. Brit. Emp.*, 52: 570, 1945.

There is much controversy about the benefits of vitamin E in abortion or premature labour. The authors again emphasize its importance in the following terms.

A series of 63 cases of threatened premature labour is presented. Of these 73% were salvaged. Of the patients in this group on whom a blood-oestrogen was done, 87% showed a high blood-oestrogen, even early in pregnancy. The only therapy used was vitamin E with or without temporary rest in bed. The importance of using a vitamin E preparation of reliable potency, both in adequate dosage and until term, is emphasized again. Of the 109 patients included in this and previous

reports, there were 6 monsters delivered, only one, with a cleft palate, surviving over three months. But 92 normal living children were obtained. Their preservation would seem justifiable.

P. J. KEARNS

Etiology and Treatment of Heartburn of Pregnancy. Wiley, H. M.: *Am. J. Obst. & Gyn.*, 51: 221, 1946.

Heartburn of pregnancy is a very common condition. It is now believed that neuromuscular dysfunction of the oesophagus and stomach is the underlying etiologic mechanism. Prostigmine bromide by mouth is a rational therapeutic agent and has been demonstrated to afford prompt and complete relief in 15 out of 20 patients and partial relief in two.

ROSS MITCHELL

The Value of Physiological Substrates in Sperm Migration in Selected Cases of Human Infertility. Siegler, S. L.: *Am. J. Obst. & Gyn.*, 51: 13, 1946.

Evidence is cited to indicate the importance of physiological isotonic substrates to sperm metabolism and motility. The application of these important animal husbandry and preclinical observations to the relief of human infertility, in carefully selected cases, is discussed. Among 106 such couples, giving a history of 1 to 14 barren years, Ringer-glucose isotonic solution was used precoitally as a vaginal irrigation, and the author is able to report 23 successful conceptions, a salvage of 28.3% from this group of infertile patients.

This procedure, because of its simplicity in application, is worthy of extended clinical trial and is recommended in those cases of infertility exhibiting no obstructive organic pathology.

ROSS MITCHELL

Penicillin in Obstetrics. Power, H. A. and Cravotta, C. A.: *Am. J. Obst. & Gyn.*, 51: 230, 1946.

Penicillin deserves serious consideration in obstetrical complications attended by infection, potential or actual. Acute mastitis responds with amazing rapidity. It is possible that lactation may be resumed. The prophylactic administration of penicillin following prolonged rupture of membranes, prolonged inertial labours, and in other patients potentially infected is apparently effective in assuring a smooth convalescence and in shortening the period of hospitalization. If this is substantiated by further investigation, it will undoubtedly broaden the use of low cervical Cæsarean section. A routine culture should probably be taken from the lower uterine segment at operation. The treatment of infection following Cæsarean section in this series has been effective.

In incomplete septic abortion, particularly where there is a marked secondary anaemia, a leucopenia, or both, penicillin is undoubtedly safer than the sulfonamides. The absence of other undesirable features of sulfonamide therapy will also recommend this drug. Previously reported efficacy in the treatment of gonorrhœal infection is substantiated. Pyelitis due to streptococcal infection may indicate penicillin therapy.

The sole experience with postpartum pelvic cellulitis was disappointing; however an occasional penicillin-resistant streptococcus or staphylococcus will undoubtedly be encountered, and may have been a factor.

No conclusions can be drawn concerning phlebitis. Penicillin is apparently of value in the treatment of acute suppurative mastitis and may eliminate additional surgery. The disappearance of any vestige of induration has been an outstanding finding in mastitis results.

ROSS MITCHELL

The Obstetrician's Responsibility for the Hazards of the First Few Days of Life with Special Reference to Anoxia and Prematurity. Beck, A. C.: *Am. J. Obst. & Gyn.*, 51: 173, 1946.

The annual maternal and infant mortality at the Long Island College Hospital is given for the five-year period from 1940 through 1944. Anoxia and prematurity were the commonest causes of neonatal

deaths. The cause of anoxia and suggestions for its prevention and treatment are given. The various measures which might reduce the incidence and mortality of premature births are outlined. The cause and prevention of pressure effects on the head of the premature infant are discussed. The results of the various methods of delivery of premature infants are compared. Breech delivery is found to be most dangerous and the cause of the great danger of this method of delivery is emphasized. Spontaneous vertex delivery accompanied by episiotomy under local anaesthesia is the safest method of delivery for premature infants. Caesarean section is not a dangerous, but a valuable method of delivery. The high premature infant mortality which is recorded for this operation usually is due to the maternal or fetal complication which serves as the indication for the operation rather than to the method of delivery. ROSS MITCHELL

Pædiatrics

Sulfathiazole in the Control of Epidemic Diarrhoea of the Newborn. Leff, M.: *Am. J. Obst. & Gyn.*, 51: 87, 1946.

Sulfathiazole given promptly at the very onset of epidemic diarrhoea in the newborn infant cures the disease in less than twenty-four hours and prevents its spread in the newborn nursery. ROSS MITCHELL

Epidemic Poliomyelitis. Gebhardt, L. P. and McKay, W. M.: *J. Pæd.*, 28: 1, 1946.

This is an epidemiological survey of the 1943 poliomyelitis outbreak in Utah. The characteristic seasonal incidence of the disease in the United States, and possible modes of transmission advanced by previous writers, such as direct contact, usually through nasopharyngeal droplet infection; or by contaminated water, milk or food; or through insects, are briefly discussed. Comparison is made with some corresponding features of other epidemic conditions—meningococcal meningitis, whooping cough, measles, mumps, and chickenpox, disseminated by contact, and enteric ailments, such as typhoid fever and dysentery, spread through infected food or water.

In 1943 there were 400 cases of poliomyelitis reported in Utah. The disease became epidemic in late August and early September. Some common factor in the cases was sought, and possible means of transmission considered. Contact exposure was rare, being known in only 13.6% of 241 cases. Reopening of schools, after temporary postponement or closing, with increase of contacts indoors and out, apparently did not lead to any greater incidence. Water supplies from diverse sources, and varied swimming places, natural and regulated, did not show any connection with spread of the virus. Insect bites by mosquitoes or flies were common among the cases, but about the same percentage of bites, 43.5, was reported in a comparable group of healthy people. Milk supplies came from a variety of sources, and no correlation with the incidence of cases was elicited. Foodstuffs, uncooked, unpeeled, and unwashed, were carefully considered. As the virus is destroyed by heating to 60° C. for a few minutes, cooked foods were omitted from the survey. Of 206 cases, all had eaten of unwashed or unpeeled fresh fruits or vegetables one or two weeks or more before the onset of the disease. Apples, peaches, pears, or tomatoes were those most commonly reported; cherries, grapes, apricots, plums, celery, and carrots were less frequently taken.

The authors note suggestions previously advanced by Toomey, that epidemic poliomyelitis and the peak harvest of fresh fruits may have some relationship, and that flies are more numerous during the fruit seasons. Graphs are presented to illustrate the parallels between the case peaks of the epidemic disease in September 1943, and the production seasons of certain fruits, in Utah and New York. A graph for California shows

a similar relationship, with the epidemic appearing somewhat earlier and having almost as many cases in August as in September, corresponding to a longer harvest season and more varied products.

Other investigators have shown that the virus is present in the stools of patients and of carriers, that it can be found in sewage, and that it may be harboured by certain flies. The suggestion is made that the virulence of sewage or fecal virus may be enhanced by passage through the flies. The latter may deposit virus-containing faecal material on fresh fruits and vegetables. One or more units of a given group of foodstuffs may be thus contaminated. Enough virus may be present in the fly faeces to cause disease when ingested by a susceptible individual, or only a small subinfecting amount, resulting in a mild sub-clinical attack followed by immunity. One or more members of a family may be involved.

In this epidemic, 45 multiple cases occurred in 20 families, 32 developed within five days after the first in the family, making it probable that most of the patients were infected from the same source at about the same time. Contaminated foodstuffs could be the common virus source in these family cases. Flies of different species were notably prevalent in Utah in August and September of 1943. In 1944 there were comparatively scarce. Only 24 cases of poliomyelitis were reported in the state that year. In two communities surveyed, areas with faulty sewage disposal, such as open privies and drains, had a high incidence of the disease.

The authors hold that the concept "virus-to-fly-to-food-to-patient seems to be in the realm of probability". Contaminated food may be widely distributed. Sporadic cases in remote and isolated places could thus be explained. They suggest that poliomyelitis belongs to the "filth borne" group of diseases, and that "virus contaminated food" may have an active rôle in its spread. Isolation of the virus from fly-contaminated bananas has recently been reported by Ward and associates. Another possible means of spread is through the bites of insects. R. CAMERON STEWART

Oto-Rhino-Laryngology

Comparison of Improvement in Hearing Following the Fenestration Operation with that Obtained by Wearing a Hearing Aid. Shambaugh, G. E.: *Arch. Oto-Laryngology*, 41: 189, 1945.

The author recalls that those persons who are ideal subjects for the fenestration operation are precisely the ones who are most helped by a hearing aid. Two years ago, it was stated there was a ratio of approximately 23 to 43 between gain in hearing from fenestration and that from a well fitted hearing aid. At the same time, the author performed the fenestration operation on the wife of an acoustical engineer; seven months after operation, an audiogram of her hearing showed a 36 decibel gain for speech frequencies, bringing the hearing in the fenestrated ear to an average loss of 17 decibels for speech; her hearing improvement has been maintained up to now.

One must remember that the hearing aid shows to its best advantage when tested with pure tones, for in a sound-proof room the aid can be used at its maximum volume for threshold tests, with little interference from outside noises which combine to interfere with the hearing of speech. The chief point is to depend on a satisfactory method of measuring the hearing for speech rather than the hearing for pure tones in terms of decibels. Dr. Scott Reger, of Iowa City, constructed an audiometer adapted to measure the hearing for speech.

The prospective ideal subject for the fenestration may be told that he has approximately a 90% chance of a lasting improvement in hearing and approximately a 70% chance that the hearing will equal or surpass that with a hearing aid. V. LATRAVERSE

Pathology

Cancer in Relation to Usages. Khanolkar, V. R. and Suryabai, B.: *Arch. Path.*, 40: 351, 1945.

To the well-known Kangri cancer of Kashmir the authors have added three interesting new types that are found in India. These are the dhoti, chutta and khaini cancers. The dhoti cancer is found among those who wear a garment consisting of a long, wide strip of cloth wound about the waist and crossing the groin. This garment, called a dhoti or saree, causes pressure upon the two loins, the right groin, the inner surface of the right buttock and along the midline behind the sacrum. It is at these pressure points that skin carcinoma of the squamous cell type occurs among those who wear the dhoti. Chutta cancer is a cancer of the hard palate, usually squamous cell in type and usually preceded by leukoplakia. It is found among those who smoke the chutta. This is a roll of dried tobacco made into a cigar and tied at one end with a piece of string. Because the chutta will not draw properly and repeatedly goes out, the habit has arisen of holding the lighted end inside the oral cavity to keep it burning for a longer time, thus exposing the palate to a temperature of about 150° F. and to the fumes of the glowing end of the cigar. The third type of cancer associated with local usage is a squamous cell carcinoma of the lower lip found among the users of khaini. Khaini is a mixture of powdered dried tobacco and lime. A suitable mixture is prepared in the palm of the left hand by rubbing the constituents with the right thumb, and a pinch of the mixture is then placed between the front teeth and the lower lip. It is left there until it gradually becomes diluted with saliva, is swallowed, and is then replaced by a fresh mixture.

The authors point out that, while these three types of social cancer obviously suggest a relationship between chronic irritation and the development of carcinoma, it is insufficient to dismiss the association as a simple causal one. They emphasize that exposure to a carcinogen is only one factor in the induction of cancer, and that the competence of the affected tissues to react with neoplasia is a factor of equal, if not greater, importance in this induction.

G. C. McMILLAN

Hygiene and Public Health

Danger in Use of Boric Acid. Hughes, F. N.: *Canad. Pharm. J.*, 79: 38, 1946.

"The use of boric acid preparations should be discouraged because of their limited usefulness and the real dangers of their accidental and intentional use." This conclusion was reached by a member of the staff of University of Michigan Hospital after considering literature on the subject as well as experiences in that hospital. The author of this article draws the attention of pharmacists to the above statement, together with other present opinions all of which are based upon quite substantial evidence. He points out certain inherent dangers in the use of borates. Cases of accidental poisoning from the oral ingestion of boric acid are quoted and also cases of boron poisoning due to the indiscriminate use of the drug when applied as an ointment, dusting powder or solution. As the rate of excretion from the body is slow, boric acid should be regarded as a cumulative poison. For this reason its constant use over a long period, is dangerous, if under conditions where absorption can take place.

Recognizing the dangers from indiscriminate use of the drug, the British Pharmacopœia in the Sixth Addendum 1944, reduced the strength of the official ointment from 10 to 1%. As boric acid in this low concentration is of little value as an antiseptic, the author is of the opinion that this ointment may before long disappear from the pharmacopœia.

MARGARET H. WILTON

Five Year Survey of Methods for Artificial Respiration. Ross, B. D.: *J. Am. M. Ass.*, 129: 443, 1945.

In this article is presented the final report of a survey conducted by the Council on Physical Medicine. Their aim was to get sufficient data from various life-saving organizations on actual cases of artificial respiration, to permit the drawing of conclusions regarding efficacy of different methods. A total of 3,352 reports was obtained, from the United States Coast Guard and from the Chicago, Los Angeles and Detroit fire departments, during the years 1940 through 1944. Each of these organizations had a trained life-saving crew, equipped to make a fairly accurate report and to keep records. They were asked to report every case, whether death or revival occurred, to state the cause of asphyxia, the method of resuscitation, the time that elapsed before artificial respiration was begun and an estimate of the results. Autopsy reports were also requested.

Copies of the report forms used by the various organizations, are shown, together with tables representing analyses of the data. The common causes of asphyxia included cardiac causes, immersion, asphyxia neonatorum, carbon monoxide, and suffocation. In 1,633 cases there was no spontaneous respiration at the start of treatment. Of these there were 227 survivals and 1,406 deaths. In 153 of the 227 survivals the use of a resuscitator resulted in revival. The Schafer method was used beforehand in 13 of these cases. None of the 153 patients showed evidence of injury as the result of the method of resuscitation. In 58 cases of acute asphyxia, the Schafer prone pressure method effected revival. In 8 of these an inhalator was used at the same time. There was no report of fractured ribs. The 16 other survivals were treated by the mouth to mouth method, the Silvester, the pulmotor, or a combination of methods.

Of 1,719 cases of abnormal respiration, there were 1,679 survivals and 40 deaths. Cardiac cases formed the largest group here. The inhalator was the method used in 95.2% of the survivals. Analysis of the data also gave an idea of the survival rate for each cause of asphyxia. That for cases of electric shock was poorest—no survivals, 16 deaths. That for cardiac cases was also very poor—1 survival to 42.7 deaths. The author is of the opinion that the scarcity of data regarding the lapse of time between asphyxia and the start of treatment, and the lack of autopsy reports, are factors which weaken the value of this survey.

MARGARET H. WILTON

OBITUARIES

Colonel Thomas Bedell, M.D., passed away at Prince Edward County Hospital on February 17, following a period of failing health. He was in his 72nd year.

From his early years, the colonel's life was associated with the uniform of his King and Country. While attending High School in Picton, he joined the Hastings and Prince Edward Regiment, (then the 16th).

He was born in Hillier Township. Graduating from Toronto University in 1896, he practised his profession in Merrierville.

On the outbreak of the first Great War, he proceeded overseas with the 48th Highlanders as a combatant officer. The practise of medicine as an army surgeon was too tame for a man of his fighting blood. In England, he was president of the Pensions and Claims Board in the early days of that war, and in the combat zone, he was 2nd in command of the 48th.

Recruiting was lagging for the 156th Battalion, back home in Canada, and the colonel returned to Canada to take over, and quickly make the battalion up to strength.

His profession caught up with him, when in England again, and he was placed in charge of the large Ca-

nadian military hospital at Epsom, later of the hospital at Cooden, Bex-hill-on-Sea.

In this war, he served in the early years as a member of the medical board at Picton Armouries, including last year, he was medical officer for the Point Petre camp. He has been medical officer for the village of Bloomfield for a number of years, practising medicine in Bloomfield for the past 20 years.

He is survived by his widow, one son and one daughter.

Dr. W. H. Clark died at his home in Portage la Prairie on March 24, after a long illness. Born in London, Ontario, 69 years ago, he graduated in medicine from Western University, London, in 1902. In the following year he came to Winnipeg and served as an intern in the Winnipeg General Hospital. For ten years he practised at Oakville, Manitoba, then moved to Portage la Prairie in 1913 where he practised until his death. Outside his practice he was active in the Methodist and later the United Church, and in fraternal societies. He was keenly interested in curling. For a time he was a member of the executive committee of the Manitoba Medical Association.

He is survived by his widow and two sons, one of whom is Dr. Cecil Clark of Winnipeg, until recently Lieut.-Col. Clark of No. 5 Canadian General Hospital, R.C.A.M.C.

Dr. Nicholas W. Cousens, aged 82, a graduate in medicine from the University of Toronto in 1891, died in Waltham, Mass., recently where he had practised for more than 50 years. A native of Alexandria, P.E.I., Dr. Cousens inaugurated an oxygen technique for the treatment of influenza during World War I. He is survived by his widow.

Dr. Rodolph Dazé, veteran practitioner of the Laurentian district, died March 15, after a long illness. Dr. Dazé lived at Ste. Agathe where he practiced for nearly a half century.

He is survived by his widow, a daughter and two sons.

Dr. Helen T. Drummond died suddenly in Montreal, April 1.

Dr. Drummond, the former Helen Julia Hill Taylor, who was in her 55th year, graduated in medicine from the Women's Medical College in Philadelphia in 1915. After practicing in Baltimore, Md. and Denver, Col., she came to Montreal where she was attached to the anæsthetic department of the Western Division, Montreal General Hospital, later joining the staff of the Department of Public Health of the City of Montreal, a position which she held for the 15 years before her death.

She is survived by her parents, her husband, J. S. Drummond, two daughters, and a son.

Dr. Victor Franklin, of Ottawa, died suddenly in a hotel in Victoria, B.C., March 19. He was 27 years of age.

Born at The Pas, Manitoba, the late Dr. Franklin came to Ottawa with his parents when he was in his youth and was educated at local schools. Following his graduation from Lisgar Collegiate, he studied at Queen's University, graduating from there last year.

Following his graduation he moved to Port Simpson, B.C., where he attained the post of assistant director in the hospital there. Dr. Franklin had moved to Victoria only a month ago following the closing of the hospital in Port Simpson.

A prominent student in athletic organization at Lisgar Collegiate the news of Dr. Franklin's passing will come as a shock to a wide circle of friends he had made during his stay in the Capital.

Surviving in addition to his parents are two brothers. His father is the chief treasury officer of the Department of Reconstruction and Supply, Ottawa.

Dr. William Harry Godfrey, aged 67, died at his home in Toronto, March 13. He had been a medical practitioner for the last 10 years in Toronto.

Dr. Godfrey was born in Carlisle, England, coming as a child to Canada, his parents settling in Scarborough Township. Graduating in medicine from the University of Toronto in 1904, he took postgraduate study in surgery in Chicago. After 10 years' practice in North Dakota, he practiced for a time in Hamilton prior to coming to Toronto.

An expert swimmer, Dr. Godfrey, some years ago, was awarded the Humane Society medal for saving the life of a woman in danger of drowning. He was also a football player during his university course. A member and sidesman of St. Chad's Anglican Church, Dr. Godfrey was an active member of St. Clair's "Sixty Club".

Surviving are his widow, a son and three brothers.

Dr J.-A. Johnston, président de la Johnston Asbestos Co., de Thetford-les-Mines, mourut le 4 mars à sa résidence à Québec.

Agé de 70 ans, le Dr Johnston était né à Claplam, comté de Mégantic. Il fit ses études classiques au collège Bishop de Lennoxville et ses études médicales à l'université McGill, qu'il alla ensuite poursuivre à l'université d'Edinburgh, en Ecosse, et dans des universités d'Europe.

Le Dr Johnston exerça sa profession à Québec pendant quelques années. Depuis dix ans il était président de la Johnston Asbestos Co. à Thetford-les-Mines. Il avait épousé en première alliance, en 1905, Anna-Muriel Evans et, en seconde alliance, en 1926, Rosemary Kernan, sœur de M. Robert-P. Kernan, de Québec, président de la Donnacona Paper.

Outre son épouse, le Dr Johnston laisse deux enfants.

Dr. Wilfred Lefebvre, of Montreal, died of a heart attack in a New York hotel March 19. Dr. Lefebvre and his wife were returning to Montreal from an extended visit to Florida.

Dr. Lefebvre was born at St. Guillaume d'Upton and studied at the St. Hyacinthe Seminary and the College of Montreal and after practicing two years in Sudbury came to Montreal.

He is survived by his widow, a son and a daughter.

Dr Benjamin Maurault est décédé après une longue maladie à l'âge de 69 ans et 10 mois. Né à Pierreville il fit ses études au Séminaire de Nicolet et obtint son doctorat en médecine de l'Université Laval (Montréal), en 1902. Il pratiqua à Pierreville et dans les paroisses environnantes jusqu'en juillet 1944 alors que la maladie l'obligea à prendre sa retraite.

Il fut le premier président de l'Hôpital du Christ-Roi de Nicolet. Il fut aussi président de la société médicale des comtés de Nicolet et d'Yamaska agent du gouvernement canadien depuis 1921 pour les Abénakis, Grand Chevalier du conseil de Pierreville et député de district des Chevaliers de Colomb.

Lui survivent son épouse et sa fille.

Dr. Dorothea Orr, long known as one of the oldest women doctors in Toronto, died March 22, in a convalescent home following a lengthy illness. She had been in semi-retirement for ten years.

Born Dorothea Johnston at Whitby, Ontario, Dr. Orr came to Toronto to study at the university. Shortly after she met and married the late Robert Kimball Orr, one of the professors. Following her husband's death, Dr. Orr resumed her studies and graduated from the University of Toronto School of Medicine. She interned at a children's hospital in New York and eventually became head staff doctor there.

Moving back to Toronto, Dr. Orr established a practice which she maintained for about 35 years. She was on the staff of the Women's College Hospital for some time. Dr. Orr attended Dovercourt United Church.

She is survived by her sister, Miss Elizabeth Johnston.

Dr. Alexander Rose Pennoyer died suddenly on April 3, in Montreal. He was in his 77th year.

A native of Gould, Quebec, Dr. Pennoyer began his medical career in Buckingham, Quebec, following his graduation from McGill University in 1897. He came to Montreal in 1902, interrupting his local practice in 1907 and 1908 to go abroad for postgraduate study in surgery in London and other European cities. Returning to Montreal, he specialized in surgery at the Montreal General Hospital, and was consulting surgeon at the hospital when he retired, after 17 years as chief medical adviser to the Bell Telephone Company in 1940.

During the first Great War he was a member of the medical staff of Military District No. 4, and was on the staff of McGill's Faculty of medicine from 1903 to 1923. While a student at McGill he won the highest standing in his classes in the last two years and graduated as "Final Prizeman".

He was president of the Province of Quebec Industrial Medical Association for several years, and had been a member of the Montreal Medical Relief Committee for four years before he retired in 1940. He was also a member of the College of Physicians and Surgeons of the Province of Quebec and of the Montreal Medico-Chirurgical Society.

He is survived by his son Albert Ross Pennoyer, a grandson, a sister and a half brother, J. M. MacKay, of Toronto. Dr. Pennoyer's wife died a year and a half ago.

Dr. Daniel Plouffe, died suddenly at his home in Montreal recently. He was in his 64th year.

He had been connected with the Montreal Jail hospital at Bordeaux for the past 20 years and during that time had been in charge of almost 7,000 prisoners. His skill and ability with a criminally insane at the only institution of its kind in Canada was well known.

Born at Southbridge, Mass., Dr. Plouffe received his early education at the College of Ste. Therese de Blainville and later entered Laval University, Montreal, graduating with his doctor's degree in 1910.

Always keen on new developments, Dr. Plouffe became interested in radiology while practising general medicine with the late Dr. A. H. Desloges at the Hotel Dieu. In 1919 he specialized in psychiatry at St. Jean de Dieu Hospital and in 1926 he was appointed director of the new Montreal Jail Hospital for the criminally insane.

A fellow of the American Psychiatric Association and winner of a scholarship from the Provincial Government, Dr. Plouffe was presented with a membership in the Society Medico-Psychologique de Paris, in France, 1929.

He is survived by his widow, a son, a daughter, and seven brothers.

Dr. W. A. Richardson, aged 85, first medical superintendent of the Royal Jubilee Hospital, Victoria, and oldest practising physician in British Columbia at the time of his retirement two years ago, died March 14. Born in Toronto and a veteran of the Riel rebellion, Dr. Richardson came to British Columbia in 1888 as surgeon at Donald, B.C., for the C.P.R.

Dr. E. J. Ryall died in Deer Lodge Military Hospital on March 22, after a long illness. Born at Chatham, Ontario, he came to Winnipeg with his parents in 1902. The first Great War interrupted his medical studies and he served overseas with the 10th Field Ambulance. On his return to Canada he graduated in 1920 and practised for seven years at Waskada, Man. After postgraduate work in New York he resumed practice at Somerset until ill health forced his retirement in 1940. Active in the Canadian Legion, Dr. Ryall served for several years as president of the Somerset branch. He is survived by his widow.

Dr. Edward J. Williams, D.S.O., B.A., C.M., F.A.C.S., died at the Homœopathic Hospital, Montreal, April 5 after an illness of six weeks. He was in his 74th year.

Dr. Williams held high posts with the Canadian Army Medical Corps during the first Great War, in which his services won his recognition in despatches and also the Distinguished Service Order. He had been in ill health for a considerable time.

Born in Franklin Centre, Quebec, June 23, 1872, he was the son of Rev. Thomas G. Williams, D.D., and Margaret Murray Williams. Later the family moved to Ontario and Dr. Williams was educated in the public schools of Brockville. He entered McGill University at the age of 15, and took the Bachelor of Arts Degree in 1892. He graduated from the Medical School in the same university in 1897 with the degree Doctor of Medicine, Master of Surgery.

In 1899 he was chief surgeon at the Sherbrooke General Hospital, Sherbrooke, and in addition he operated his own private hospital. In 1914 he enlisted for active service in the Great War and was commissioned a major. In France he was chief surgeon of the First Canadian Stationary Hospital until, six months later, he was given command of No. 1 Canadian Stationary Hospital at Lemnos Islands, (Dardanelles) and later proceeded with his unit to Salonika, Greece.

In April 1917, he returned to England, where he was in command of No. 13 General Hospital, at Hastings. Later he was in Command of No. 9 General Hospital, also in England and remained with that unit until it closed in 1919.

On his return to Montreal he continued his interest in the men of the Canadian army and after the war and demobilization he carried on his work as head of the former two Red Cross Hospitals on McTavish and Dorchester streets.

In his younger days Dr. Williams took an active interest in outdoor sports. He was fond of hunting and fishing and was a member of the Iroquois Yacht Club, of which he was Commodore in 1927 and 1928, having been one of its organizers. When in Sherbrooke, he was president of the St. Francis District Medical Association. He was a member of the Canadian Medical Association, and the Montreal Medico-Chirurgical Society and a Fellow of the American College of Surgeons. He was a former member of the University Club.

He is survived by his widow, two sisters and one brother.

NEWS ITEMS

Alberta

At the Spring 1946 Session of the Alberta Legislature, an Act to provide health services for the people of Alberta was passed. The benefits to be provided shall be prevention of disease, and the application of all necessary diagnostic and curative procedures. These shall include: (a) medical, surgical and obstetrical benefits, (b) dental benefit, (c) pharmaceutical benefit, (d) hospital benefit, (e) nursing benefit. These may be provided singly, in part, or in whole. Persons entitled to benefits are—any adult who has resided in the Province for 12 months out of the 24 months immediately preceding such date as his name placed upon the register of a district; each dependent of an adult and any person on whose behalf the annual fee has been paid for, or for whom the Municipality in which he resides is liable under the provisions of the Municipal Act governing the municipalities.

The Act will be administered by the Minister of Health through a Director of Health Insurance. An advisory committee of not less than seven, nor more than eleven members holding office during pleasure, representing persons or corporations which provide services and classes of persons who receive benefits shall be appointed by the Minister. The Minister, through his Director, shall enter into agreement with physicians, surgeons, dentists, hospitals, or corporations for the provision of services under the Act.

Health Insurance Districts may be established from time to time by the Director. Having drawn up a plan for the provision of services in a district, the people shall vote on the plan. If 60% of the voters are in favour of it, the plan will go into effect. If, after a District has been in actual operation for at least one year, a petition signed by at least 25% of the adults residing in the district is presented to the Director, the Director may, by direct vote, disestablish the District.

The costs of Health Insurance in any District is to be met by a payment of an amount not greater than \$10.00 per adult. This amount is to form all or part of 40% of the total cost; the remaining 60% is to be met by the Federal Government.

One section of the Act provides for a penalty for any person who fails, without lawful excuse, to provide adequate service agreed upon.

The University of Alberta Medical Faculty is holding the fifteenth annual Refresher Course in the Medical Building, Edmonton, from Monday, May 13, to Friday, May 17.

Dr. C. C. Sturgis, Professor of Medicine at Ann Arbor, Michigan is to speak on Monday and Tuesday. Dr. C. W. Burns, Lecturer in Surgery, University of Manitoba, Winnipeg, will be visiting lecturer on Wednesday and Thursday, and on Friday Dr. A. D. McLachlin, the new Professor of Surgery at the University of Western Ontario in London, will speak. Dr. A. H. Baker, Medical Superintendent and Director Division of Tuberculosis Control at the Central Alberta Sanatorium in Calgary will also be a speaker on Friday.

It is expected that there will be a large attendance at the course. The attendance last year was two hundred doctors. In view of the somewhat limited bed accommodation available, the doctors are urged to send, at the earliest possible moment, their request for room accommodation. This should be addressed to the Refresher Course, University Hospital, Edmonton.

G. E. LEARMONTH

British Columbia

A special meeting of the Victoria Medical Society was held recently, at which Dr. A. E. Archer, Consultant on Medical Economics, addressed the members on the subject of "Health insurance". A very active discussion followed.

Preparations for the annual meeting of the Canadian Medical Association at Banff are now well advanced. Unfortunately, the restricted accommodation available makes it impossible for the Committee on Housing to accept all the applications that are being made. It is earnestly hoped that the next meeting will not have to contend with this difficulty.

The opponents of chlorination of water on the Lower Mainland, including Vancouver, the largest city in British Columbia, have prevailed, temporarily at least, against the more scientific counsels of experts in public health and bacteriology, and chlorination is to be discontinued. This is a very disturbing and reactionary proceeding, despite of the advice of those who, in the opinion of the vast majority of the medical profession at least, are best fitted to advise on this matter. We note that other cities in B.C., notably Victoria, are continuing chlorination, and we congratulate them on their good sense. The detection lately of at least two cases of typhoid on the Lower Mainland makes this backward step particularly dangerous.

There has been a serious outbreak of smallpox, of the hæmorrhagic type, in Seattle, immediately to the south of the international border. There have been several deaths, but the situation is, we are assured, well in hand. This has led to a tremendous demand

for vaccination in B.C., and for a while, there was a great shortage of vaccine. The health authorities, however, have done a splendid job. They have procured adequate supplies from the Connaught Laboratories in Toronto, with amazing speed, and have opened vaccination clinics at a great many points. People here are applying in very great numbers, and there is no doubt that before the clinics are closed, the great majority of the population will have been given protection. This is in definite contrast to the last time we had the problem of active smallpox to face, in 1932, when the antis were very vocal, and a campaign had to be fought by the Health Department, with newspaper ads and other publicity methods, to inform the public of the truth with regard to smallpox and vaccination. In that epidemic there were several deaths, more than have taken place in Seattle, before the efforts of the authorities were successful in getting it under control.

The Legislature of British Columbia is now in session in Victoria and certain matters of interest to medical men have come up. Some minor changes are contemplated in the Medical Act, and this is always a matter of some concern, as once an Act like this is opened, it gives opportunities for a great deal of discussion, not always edifying. There have been questions about Health Insurance, and quite an explosion was touched off at one session, by the allusion on the part of one member to chlorination.

A new medical member in the House is Dr. R. R. Laird, who lost a leg, as a result of wounds received at Dieppe. He has spoken on several occasions, and has made a very good impression.

Vancouver was fortunate to have as a recent guest Dr. Alan Brown, of Toronto, who needs no introduction. Dr. Brown was here on a more or less unpublicized mission of consultation, with those who are specially concerned with the matter of Children's Hospitals in Vancouver. At present there is no co-ordination of the activities of those institutions which care for sick children, and Dr. Brown, we understand, advised very strongly in favour of a merging of all these in one central children's hospital. We are very sure that he is right, and hope this will be done speedily.

Men are gradually returning to practice in civilian life, as they obtain their discharge from the Forces. Major Kingsley, R.C.A.M.C., is now with the Department of Veterans' Affairs in Victoria; Capt. H. E. Hamer, is in practice in Revelstoke; Capt. N. F. A. McSweyn in Prince Rupert. Dr. Leonard Bapty, from the same branch of the Service, is now practising in Victoria.

From the Air Force come Dr. C. G. Morrison, now with the Williams Clinic at Trail, and Dr. J. E. Dalton, now at Esquimalt, while Dr. H. G. Baker of the Naval Medical Services, is now working with the Metropolitan Health Bureau in Vancouver. J. H. MACDERMOT

Manitoba

Manitoba Medical Association created a precedent in holding a two-day business session on March 13 and 14, in the Royal Alexandra Hotel, Winnipeg. Dr. P. H. McNulty, President, and Dr. J. R. Martin, First Vice-President, presided at the meetings. Dr. A. E. Archer, liaison officer of the Canadian Medical Association was a welcome visitor and gave valuable advice. On the evening of March 13, officers of the Manitoba Medical Service, a prepayment medical service organization under the auspices of Manitoba Medical Association, gave an account of their stewardship. Municipal doctor contracts were discussed and those present voted on a number of resolutions concerning these contracts. The D.V.A. schedule was adopted by a large majority as the fee schedule of the Manitoba Medical Association. On the

evening of March 14 the Association gave a complimentary dinner to the Manitoba doctors who had served in the armed forces. Dr. W. A. Gardner, who was in his best form, welcomed the service men. The impromptu program put on by No. 5 Canadian General Hospital and No. 5 Canadian Field Ambulance, with Lieut.-Col. Norman Elvin and Lieut.-Col. C. E. Corrigan respectively in solo parts, brought down the house.

The Winnipeg General Hospital has reopened its physiotherapy department.

On March 12, Dr. P. H. T. Thorlakson addressed the Young Men's Section of the Winnipeg Board of Trade on the Manitoba Medical Centre.

St. Boniface Hospital staff on March 15 and Winnipeg General Hospital staff on March 16 presented clinical sessions at their respective hospitals for returned service physicians.

The Winnipeg Anaesthetic Society held a two-day meeting on March 15 and 16, with Dr. Ralph Knight, Minneapolis as guest speaker. Dr. Knight and Dr. P. H. T. Thorlakson presented papers at the regular monthly meeting of the Winnipeg Medical Society on March 15. The subjects of the papers were respectively "Modern anaesthetic agents" and "Surgeon anaesthetist relationship". Dr. B. E. Leech, Regina, led the round table discussion on Economics.

On February 28, 1946, a total of 2,967 participants were enrolled in Plan A (surgery, obstetrics in hospital) and 25,320 in Plan B (complete medical coverage), a grand total of 28,287 in Manitoba Medical Service.

Good progress is being made on the additions to the Medical Arts Building and the Winnipeg Clinic building.

The Medical Library Committee reports that new shelves are to be placed in the Board Room of the Medical College where the old and rare books are stored, and that a recommendation has been forwarded for the purchase of a microfilm projector. Possession of a microfilm projector will greatly increase the usefulness of the library. Orders have been placed for Scandinavian and French periodicals which could not be obtained during the war. The purchase of a number of new books was recommended. ROSS MITCHELL

New Brunswick

Dr. E. T. Kennedy, of Sussex, suffered a heart attack while attending the present session of the New Brunswick Legislature and is a patient at the Victoria Hospital, Fredericton.

Dr. H. B. G. Parlee, of Saint John, who served as a Captain in the R.C.A.M.C. has on demobilization been appointed an assistant physician on the indoor service of the Saint John General Hospital.

Dr. Milton Gregg, V.C., President of the University of New Brunswick, presided at the annual meeting of the N.B. Branch of the Canadian Cancer Society at which meeting a membership campaign was launched. It is hoped that a total membership of 20,000 may be reached.

Group Capt. A. A. G. Corbet, of Saint John, has been appointed Director of Medical Service of Royal Canadian Air Force, with headquarters in Ottawa.

It is announced that the City of Fredericton and the Victoria Public Hospital will jointly finance a new loan to build a new Nurses' Home and a third storey in the east and west wings of the present hospital.

Dr. G. B. Peat of the staff of the Saint John General Hospital is on an extended holiday in Western Canada and the United States. A. S. KIRKLAND

Nova Scotia

With the return of a number of physicians from overseas, several changes have occurred in the visiting staff of the Victoria General Hospital. Dr. M. J. Carney has resigned from the Department of Medicine. Dr. H. D. O'Brien has been appointed to the Surgical Staff, and Dr. Clarence Gosee has been made Assistant Urologist. Dr. J. V. Graham, who was supplying on the Surgical Staff during the war years, has retired.

Dr. F. G. Mack, who was quite ill for several weeks, is much improved in health and has resumed his duties at the Victoria General Hospital.

Dr. J. C. Morrison, until recently enjoying a holiday as ship surgeon in southern waters, has returned to Halifax.

Dr. C. S. Morton for many years an active practitioner in the City of Halifax with particular interest in obstetrics and gynaecology, has retired from active practice. His friends will wish him many years of happy activity with an opportunity to pursue his hobbies.

Dr. W. R. C. Tupper, who was seconded to practise at Wallace and did so for a short time, has left to take an internship at the Children's Hospital, Halifax.

Dr. L. A. MacLeod, a graduate of Dalhousie Medical School in 1943, has gone to Malagash where he will practise in future.

The Aberdeen Hospital, New Glasgow, has been having its financial difficulties recently. The cost of patient maintenance has risen sharply with no particular increase in the amount of revenue. As a considerable portion of its income is derived from the check off from the miners employed by the coal companies in the surrounding districts, new contracts calling for an increased weekly contribution are proposed.

Charges are at present being dealt with in the courts against the Ideal Maternity Home at Chester.

Dr. D. J. Hartigan, of New Waterford, is reported to be on the sick list.

Dr. J. G. B. Lynch is now attending the Congress of Industrial Physicians at Chicago. Dr. Lynch is the surgeon in charge of the Emergency Hospital of the Dominion Steel & Coal Company Ltd., Sydney. H. L. SCAMMELL

Ontario

The annual meeting of the Ontario Medical Association will be held in Toronto May 20 to 24. A scientific program of a high order is being prepared by the President, Dr. Magner. A large attendance is expected but hotel accommodation is very limited. Enquiry at the Secretary's office should be made as early as possible if provision is to be made for members from places outside Toronto.

The Toronto situation cannot be as serious as that arising from the C.M.A. meeting this year. "Beds in Banff" is the subject of discussion everywhere.

The annual meeting of Windsor Medical Services was held in Windsor on March 20. Dr. F. A. Brocken-shire, president of the company, reported a successful year.

Associated Medical Services Inc., Toronto, has acquired the building in which its offices are located and is remodelling the ground floor to provide needed space for increasing business.

Since 1924 the University of Toronto has given office room to the Canadian and Ontario Medical Associations at a rental of one dollar per year. A new building for the department of Chemistry is to be erected on the site of the building in which these offices are located so the happy arrangement has perforce to end. The Associations are moving to a new location at 135 St. Clair Ave. West, Toronto. The Canadian Hospital Association who also shared the old offices is now located at 280 Bloor St. West.

Professor James Miller has retired from his chair in Queen's University and is returning to Scotland. For many years he has been the head of the department of Pathology in Queen's and a member of the Main Board of Examiners of the Medical Council of Canada. Professor Miller has made a large contribution to medical education in Canada. Family ties in Edinburgh overweigh the attractions of this country so we are losing a great teacher and a valued citizen of Canada.

Col. J. W. Ross has returned to civilian practice in Toronto. He is still giving part time service in Chorley Park Military Hospital where he retains his position as chief surgeon.

Dr. H. S. Dunham of Hamilton who served as Wing Commander, R.C.A.F. during the war has been appointed Assistant Secretary of the O.M.A. He succeeds Dr. J. W. McCutcheon who is now administrator of the Medical Welfare Board of Ontario.

In the past six months 1,002 medical officers from Ontario have been released from the armed forces. A majority of these have returned to practice.

At a convocation of the University of Western Ontario thirty-eight graduates in medicine were given their degrees. Owing to the death of the Chancellor, the late Hon. Howard Ferguson, the Vice-Chancellor, President Sherwood Fox presided. Honorary degrees were granted Mr. Leonard Brockington and Dr. William Herbert McGuffin of Calgary.

The Ontario Cancer Foundation is conducting a campaign to increase its funds. The sum of two million dollars is being asked from the public. The Foundation hopes to greatly extend facilities for treatment and diagnosis of cancer in the province. The Canadian Cancer Society is co-operating in the movement and has been given support from the Foundation to enable it to carry on and extend its efforts in educating the public.

M. H. V. CAMERON

Notice to Members of Ontario Branch, Canadian Cancer Society.—The annual meeting of the Ontario Branch of the Society will be held at the Head Office of the Society, 280 Bloor Street West, Toronto, Canada, on Monday, May 20, 1946, at the hour of 8.00 o'clock in the evening for the purpose of receiving reports, and the transaction of such other business as may properly be brought before the Meeting. Dated at Toronto, April 5, 1946. Isabel Oliver, Secretary, Ontario Branch, Canadian Cancer Society.

Quebec

Le Dr J. L. Riopelle, professeur agrégé d'anatomie pathologique à l'Université de Montréal a été élu président de la Société de Biologie pour l'année 1946.

Les médecins de l'hôpital St-Luc de Montréal ont élu à leur bureau médical l'exécutif pour 1946: Président: Dr Pierre Smith; vice-président: Dr. L. Archambault;

bault; secrétaire: Dr P. E. Chicoine; trésorier: Dr P. R. Archambault; secrétaire des séances: Dr. L. P. Desrochers.

A sa séance du mois de décembre dernier, le Conseil de l'Université Laval a nommé le Dr Lucien Brouha professeur de physiologie appliquée et le Dr L. P. Dugal, professeur d'hygiène et de physiologie de l'acclimatation.

Le Dr R. Dugré a été élu président du bureau médical de l'hôpital St-Joseph des Trois-Rivières. Le Dr A. R. Bellemare est vice-président et le Dr J. L. Rochefort, secrétaire-trésorier.

L'Hôtel-Dieu St-Michael de Roberval a hospitalisé 1,419 malades en 1945. Le Sanatorium a reçu en plus 697 Malades qui ont passé en moyenne 192 jours au sanatorium pendant l'année.

L'Hôtel-Dieu St-Valier de Chicoutimi a établi un record de malades en janvier 1946, alors qu'il a reçu 730 malades, comparativement à 560 en janvier 1945.

Les Drs. C. B. Pierce et Louis Berger ont été élus membres du bureau des directeurs de la "Société Canadienne du Cancer".

JEAN SAUCIER

Saskatchewan

Medical men who have returned to civilian practice in Saskatchewan after service in the armed forces in Canada and overseas, are: Dr. A. Cohen of Kamsack; Dr. A. Becker, of Saskatoon; Dr. D. C. McEwen of Regina; Dr. J. J. Doyle of Esterhazy; Dr. N. L. Brown of Gull Lake; Dr. P. G. Schwager of Saskatoon; Dr. A. F. W. Peart of Swift Current; Dr. J. A. Virtue of Viceroy; Dr. H. S. Doyle of Regina; Dr. F. F. Howatt and Dr. R. A. Lewis of Vanguard; Dr. G. R. Dyker of Prince Albert; Dr. D. Young of Regina; Dr. B. H. B. Hallam of Ceylon; Dr. E. H. Duncan of Regina; Dr. W. A. Bearden of Neudorf; Dr. D. Christie of Saskatoon; Dr. W. M. R. Palmer of Saskatoon; Dr. J. C. Armit of Regina; Dr. L. C. Hacking of Regina; Dr. B. Mesbur of Regina; Dr. S. Worobetz of Saskatoon; Dr. R. C. Bridge of Assiniboia; Dr. F. C. Heal of Moose Jaw; and Dr. M. H. Moffat of Meadow Lake.

A group of Regina medical men have announced the purchase of the Darke Block for the purpose of forming a clinic.

On February 3, the Saskatchewan Government inaugurated an air ambulance service. South of Prince Albert a specially fitted ambulance plane answers calls preferably from a physician or a nurse. North of that city calls are answered by an aircraft of the natural resources department. In actual emergencies the service is available at a flat rate of \$25.00 per trip, while for non-emergency cases actual cost of the trip is charged. Doctors attending the patients are asked to make arrangements for hospital accommodation and treatment at the centre to which a patient is flown. The plane has a cruising speed of 130 miles per hour, and a range of 500 miles. An altitude of 1,000 feet or less is maintained so that the changing pressures will not affect the patients.

A first-class airman, with a war record of five years with the R.C.A.F., Keith Malcolm, is pilot. Other crew members are Flight Engineer Donald Watson, also formerly with the R.C.A.F., and Nurse M. E. Gladow, who served overseas with the Royal Canadian Army Medical Corps.

Dr. Cecil G. Sheps, who recently retired as district V.D. control officer of Military District No. 12, has been appointed assistant deputy minister of public health in the Saskatchewan Government. Dr. Sheps will

be in charge of regional public health and health services, medical services, air ambulance services, health education and two programs which are soon to be instituted, dental services and hygiene and maternal and child welfare.

It is also announced that tentative arrangements have been completed for the appointment of a permanent chairman for the health services planning commission and that the appointment is expected to be made in the fall. Pending the appointment of a permanent chairman, Dr. Sheps has also been appointed acting chairman of the commission.

A graduate in medicine from the University of Manitoba, where he was prominent in student affairs and represented Manitoba in debates with Oxford and Cambridge, Dr. Sheps did postgraduate work in England. Following experience in country practice in both Manitoba and Saskatchewan, he took up private practice in Winnipeg until he enlisted with the Royal Canadian Army Medical Corps in 1943.

During the years 1939 and 1940 Dr. Sheps was associate director of youth health services for the Manitoba department of health and public welfare. He published the report of a survey, "Health Survey of Manitoba Youth", which has been widely quoted and especially in the Heagerty report.

While in Winnipeg he was employed part time by the city health department as a school physician. While he was V.D. control officer for M.D. 12 he was also director of V.D. control for the Saskatchewan Government. All Dr. Sheps's experience in the Army was in the field of public health.

L. E. WELLS

General

The Northern California Branch of the McGill Graduates Society is sponsoring a dinner during the Convention of the American Medical Association to be held at the Bohemian Club in San Francisco on Tuesday, July 2, 1946. Graduates of all Canadian Medical Schools are invited. Register at Convention Headquarters or McGill Headquarters in the Fitzhugh Building, 384 Post Street, San Francisco, care of Dr. William M. Fitzhugh.

Extra Rations.—For the benefit of those doctors who wish to obtain extra rations for their patients, the Wartime Prices and Trade Board has issued a reminder that the doctor's statement to the Board must contain the following information; name and address of the applicant, name of the disease, kind and amount of rationed food required over and above the regular ration, the length of time these extra rationed foods will be necessary and the age of the patient, if under sixteen.

The Ration Administration has experienced considerable difficulty in complying with doctors' requests for extra rations when complete information as to their patient's requirements has not been given. For example, a doctor will write in to the Ration Office saying that Mrs. Jones needs extra sugar because she has a certain ailment, but there is no indication as to how long the patient needs the extra sugar or how much she needs, etc.

For those doctors who are not familiar with the amount of sugar, corn syrup, or other preserves which each ration book holder may obtain without any extra requisition, the Board has drawn attention to the fact that each sugar-preserves coupon is worth one pound of sugar or any one of the following: 30 fl. oz. of blended table syrup, cane syrup or corn syrup, two quarts of molasses, 24 fl. oz. of jam, jelly or marmalade, four pounds of maple sugar, or 80 fl. oz. of maple syrup until May 31, and 48 fl. oz. after that date.

Clinical Congress of American College of Surgeons in New York, 1946.—The American College of Surgeons announces that arrangements have been completed for the holding of its Thirty-second Clinical Congress at the Waldorf-Astoria, New York, September 9 to 13 inclusive. Plans include the usual extensive program

of demonstrations, scientific sessions, panel discussions, symposia, forums, Hospital Standardization Conference, medical motion pictures, business meetings, and educational and technical exhibits, which will be held in the headquarters hotel, and operative and non-operative clinics in the local hospitals. This will be the first Clinical Congress since the meeting in Boston in 1941.

Katherine Bishop Harman Prize.—The Council of the British Medical Association is prepared to consider an award of this Prize in the year 1947. The value of the Prize is £75. The purpose of the Prize, founded in 1926, is the encouragement of study and research directed to the diminution and avoidance of the risks to health and life that are apt to arise in pregnancy and child-bearing. It will be awarded for the best Essay submitted in open competition, competitors being left free to select the work they wish to present, provided this falls within the scope of the Prize. Any medical practitioner registered in the British Empire is eligible to compete.

Essays must be forwarded so as to reach the Secretary, British Medical Association House, Tavistock Square, London. W.C.1, not later than December 31, 1946.

H. Gordon Hughes of Ottawa has been appointed to head the hospital design division of the Department of National Health and Welfare. The new division will be responsible for the collection and tabulation of all the latest information on the design and construction of hospitals, public health and other clinics and similar buildings in this and other countries. Mr. Hughes will be available for consultation not only by other departments of the federal government but also by the provinces, municipalities and various bodies interested in the construction of hospitals. Establishment of the division was recommended unanimously by the provincial deputy ministers of health at the Dominion Council of Health meeting last year.

Research in Rheumatic Diseases.—The associate committee on medical research of the National Research Council is prepared to consider applications for assistance in studying causes and the prevention or treatment of arthritis. No application is pending at the present time.

In answer to questions in the House, the Minister of National Health and Welfare said that the government does not "carry on extensive research and experimentation with a view to finding cures for the various rheumatic diseases" nor does it make financial contributions to voluntary medical or other organizations devoted to such work.

Research into medical conditions can best be conducted by hospitals and other institutions actively operating in those fields, he said. The National Research Council through its associate committee on medical research does, however, make grants-in-aid to promote medical research. Approved projects must be carried out under competent direction in universities or hospitals and medical schools where adequate facilities for study are available.

When the Research Council committee was set up in 1938, rheumatism and arthritis were recognized as among diseases to be studied, but the war forestalled active steps. The committee is prepared to consider any project "that gives promise of adding to knowledge regarding the cause, methods of prevention or treatment of arthritis in the same way it does to other medical research projects."

United States Chapter, International College of Surgeons.—The International College of Surgeons, United States Chapter, will hold its Eleventh Annual Assembly and Convocation in Detroit, October 21, 22, and 23, 1946.

Surgical clinics in Detroit hospitals will feature the first morning of the Assembly. Thereafter all the meetings, the Convocation, and the Exhibition will be held

in the Masonic Temple, a splendid building affording every convenience. The Detroit Statler and the Book-Cadillac will be hotel headquarters.

UNRRA Chewing Gum Baffles Russians.—Ukrainians are baffled by the chewing gum contained in U.S. Army rations supplied by UNRRA, according to a report received at United Nations Relief and Rehabilitation Administration headquarters recently from the organization's Ukrainian Mission. Generally, however, the report says, they express great satisfaction with the quality of the foodstuffs distributed in Kiev ration stores, though they find it difficult to cook with U.S. Army stabilized butter, a mixture of cheese and butter. The Mission has asked for Quartermaster Corps instructions on the use of this item.

The report, the first received since the Mission began its work in the Ukraine, gives the result of a spot check in Kiev ration stores which, aside from bread and small quantities of Russian-grown tea, contain virtually nothing except UNRRA supplies, mostly U.S. Army "ten-in-one" rations, dried and evaporated milk, canned meat, and a little cheese and powdered egg.

UNRRA goods in these stores, the report says, are well packaged, in good condition, and carefully handled. They are prominently displayed on shelves and in store windows, with the brands and countries of origin plainly visible. Informal conversations indicated that customers are well aware of the sources of the UNRRA supplies they receive.

The rationing system employed in the Ukraine, where there is an extreme shortage of fats and meats, was described as somewhat complex but equitable and carefully administered. There are varying rations for different categories—heavy workers, office workers, expectant mothers and other groups.

Members of the Mission now are engaged in an inspection of food production and distribution in villages and on collective farms. UNRRA supplies reach the Ukraine via the Black Sea port of Odessa.

It is thorough, well written and at every point keeps the disease firmly related to the contemporary political, social and cultural environments. As an example of critical evaluation and of disciplined historical writing it has not been bettered among the many excellent books dealing with medical history which have appeared in the last decade.

The story of epilepsy from superstition to modern scientific concept is thoroughly told and fully documented. Because the shadow of antiquity lies so heavily upon this disease, the writer deals with it more exhaustively at this stage than in the later periods. He deals successively with epilepsy in antiquity, the Middle Ages, the Renaissance, the great systems and the period of enlightenment, and the nineteenth century. The book is no mere factual survey but an integrated study of the development of thought and belief, doctrine and culture of two thousand years of history as reflected in this one disease. So large a piece of work written with balance and accuracy does great credit to the author and the Institute of the History of Medicine of the Johns Hopkins University.

The illustrations are collector's gems. The format and the printing are remarkable. Every medical library and student of medical history will place this book on their shelf of the "select".

Arterial Hypertension, its Diagnosis and Treatment.

I. H. Page and A. C. Corcoran, Research Division of the Cleveland Clinic Foundation. 352 pp., illust. \$3.75. Year Book Publishers, Chicago, 1945.

This volume is in five sections. The first of these is taken up with a consideration of normal blood pressure, the various tests used for measuring vascular responsiveness and a classification of hypertension.

The second edition deals with the nature of essential and malignant hypertension, the early and late signs and symptoms, with very careful consideration of the physical examination, particularly the use of the ophthalmoscope in diagnosis, classification and prognosis. In this section also the reader is trapped for a while in the silks and scents of psychiatry but presently frees himself from the threads if not the odor and proceeds to the next section dealing with the impingement of early hypertension on the circulatory system.

The manifestations of disease of the heart in hypertension are considered in all its phases. A table of differential diagnosis of angina pectoris, coronary insufficiency and coronary occlusion is precise if elementary. The brain, kidney and pregnancy are all discussed fully in relationship to this disease.

The rationale and value of treatment, medical, surgical and psychotherapeutic, are given full and critical evaluation. The complete honesty with which this section and in fact all sections of this book are handled is one of its most refreshing features.

It is a really good volume for the student or general practitioner who wants to know what there is to be known about hypertension.

Fractures and Orthopaedic Surgery for Nurses and Masseuses. A. Naylor, Resident Surgical Officer, Westwood W.M.S. Hospital. 288 pp., illust. \$4.75. Livingstone, Edinburgh; Macmillan, Toronto, 1945.

This well illustrated work was written primarily for the nurse. Both children's and adult orthopaedics are kept in mind. The text deals with a wide range of conditions from spina bifida in the newborn to fracture of the hip in the aged. A sufficient review of the signs and symptoms and of treatment is made to give the nurse or masseuse an intelligent understanding of the condition under treatment. In the introduction it is emphasized that "A crooked body is apt to be associated with a warped mind because of the relative loneliness and the sense of inferiority felt by these unfortunate people". Therefore the mental attitude of the patient must be considered; so also must the emotional instability of children. More reference might have been made to the details of rehabilitation treatment.

BOOK REVIEWS

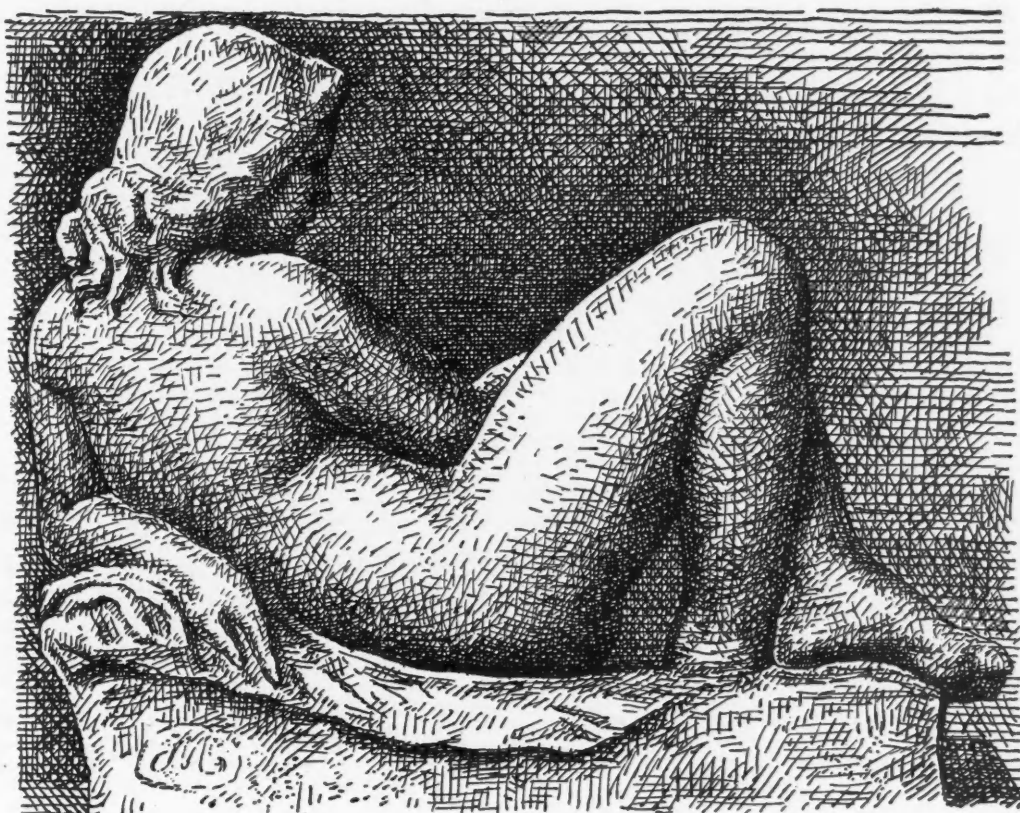
Surgery of the Spinal Column. F. H. Albee, Ex-President, International College of Surgeons. 460 pp., illust. \$10.00. F. A. Davis, Philadelphia; Ryerson Press, Toronto, 1945.

This volume summarizes the extensive knowledge of Dr. Albee in the surgery of the spinal column. It has a useful place in the library of the orthopaedic surgeon since in it can be found some account of all of the surgical problems of the vertebral column. Most valuable is the record of Dr. Albee's immense experience in this field and if sometimes his comments are flavoured with Attic salt it adds to the emphasis of his remarks. Starting with a chapter on the history of spinal surgery, there follow chapters on instruments and anatomy. Then ten chapters are devoted to various spinal diseases and conditions which are capable of treatment by surgery. There are many illustrations. This text will be valuable to the young surgeon in training and to the orthopaedic and traumatic surgeon.

Falling Sickness. O. Temkin, Associate Professor of the History of Medicine of the Johns Hopkins University. 380 pp., illust. \$4.00. The Johns Hopkins Press, Baltimore, 1945.

No disease has given rise to as large a body of historical literature as epilepsy, and it is therefore a matter of great satisfaction that in the compass of one volume all the material relating to "the sacred disease" from Hippocrates to Hughlings Jackson has been reviewed and made the subject of sound historical study. Mr. Temkin's book has involved immense labour.

* *
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Cookery Book for Diabetics. Diabetic Association. 74 pp. 4s. Lewis, London, 1945.

This practical little cookery book has been compiled by a committee on dietetics of the Diabetic Association and has been checked by the diabetic departments of a number of hospitals in England and Scotland. Many of the recipes were prepared by Miss Sybil Crerar, the late Secretary of the Association. A feature of the book is that every recipe gives the weights of carbohydrates, proteins and fat in the dish with its caloric value. All recipes are for small amounts, a commendable feature. Hints for diabetic cooking and other helpful data are included. The book has had to be printed on wartime paper but this has in no way affected the value of the text.

Textbook of Obstetrics. H. J. Stander, Professor of Obstetrics and Gynaecology, Cornell University. 3rd revision. 1277 pp., 9th ed. of *Williams' Obstetrics*. D. Appleton-Century Company, New York, 1945.

The general plan of this book is different from the previous editions of *Williams' Obstetrics*. To facilitate revisions when indicated, the various subjects are no longer presented in numbered chapters, but in sections and subheadings. Clinical pelvimetry and classifications of the abnormal pelvis based on clinical and etiological factors are discussed in a separate subsection while the discussion of the newer morphological conceptions of pelvic variation based on x-ray studies find place in a subsection of its own. This arrangement should prevent confusion for either teacher or student who wishes to use either approach to the subject.

The marked reduction in maternal mortality is discussed with much recent statistical data and the factors responsible are presented, as also are the factors necessary to bring about a comparable decrease in fetal and neo-natal mortality. Newer fields are adequately treated and the present status of chemotherapy, the sulfonamide drugs and penicillin, is clearly indicated. The Rh factor in its relation to erythroblastosis fetalis and related conditions has acquired space in the revision. Caudal block has not been overlooked.

As in the previous editions, the artistry of Elizabeth Brödel has made a notable contribution. The work is completed by an adequate index. Its excellence increased by the present revision, this book will undoubtedly maintain its popularity with students and teachers and its deservedly high place among the obstetrical textbooks of the day.

Pulmonary Tuberculosis in the Adult. M. Pinner, Chief, Division of Pulmonary Diseases, Montefiore Hospital for Chronic Diseases, New York. 579 pp., illust. \$10.25. Thomas, Springfield; Ryerson Press, Toronto, 1945.

In the preface, the author states that he is undertaking to portray "a complete plausible picture of the whole problem" of tuberculosis, under the apparently limiting title "Pulmonary Tuberculosis in the Adult". He explains that "this is the type of tuberculous disease that makes it the great medical and socio-economic problem that it is". This stand carries the implication that mastery of this type of disease would automatically solve the problems inherent in the disease. It is a common sense view, for it focuses the attention on the source of the problem—the chronic spreader.

The author accordingly marshals what we know of the bacillus itself and of its behaviour in and outside of the body. He discusses the reactions of the body to infection and re-infection, whether from without or within, as well as the factors which influence the relationships between the host and the invader. He deals with the diagnosis, the treatment, and finally the epidemiology of the disease. He sifts the evidence with discernment and meticulous care, and develops his argument methodically and logically. The result is a book that is practical, well balanced, and authoritative. As expected, it reflects the perspicacity and

mature judgment of the author. It requires concentration, and occasionally, recourse to the dictionary, but the reader is well repaid. The book is well documented with an extensive and pertinent bibliography appended to each chapter, but it is no mere compendium of current literature. The author's opinions are clearly stated and well founded. This is an important book for the student of tuberculosis, and one that should be highly appreciated.

Handbook of Psychiatry. L. J. Karnosh, Consulting Neuropsychiatrist, Cleveland Clinic and E. M. Zucker, Associate in Neuropsychiatry, Cleveland City Hospital. 302 pp., illust. \$5.00. C. V. Mosby Company, St. Louis; McInsh & Co., Toronto, 1945.

In this book the authors have made an attempt to simplify the general concepts in the field of psychiatry so that they can be understood more easily and applied more readily in general practice. A brief description is given of the commoner mental disorders with an outline of the more recent effective-treatment procedures. Special emphasis is placed on the treatment of the psychoneuroses with particular reference to some psychotherapeutic measures which can be applied by the general practitioner. Because of the non-technical language employed by the authors, the numerous case illustrations, and the emphasis on the manner in which the physician can recognize and treat early manifestations of many mental disorders, this book will be a very valuable addition to the recent literature in the allied fields of psychiatry and general medicine.

Nitrous Oxide-Oxygen Anaesthesia. F. W. Clement, Member of the Ohio Society of Anaesthetists. 2nd ed., 288 pp., illust. \$5.15. Lea & Febiger, Philadelphia; Macmillan, Toronto, 1945.

This second edition of the definitive work on nitrous oxide-oxygen anaesthesia as practised by the Toledo School bears evidence of the author's added experience in anaesthesia for the Armed Forces. Much of the added knowledge of respiratory physiology gained from the research conducted by the Air Force is incorporated in this edition. The use of curare to augment the relaxation afforded by nitrous oxide-oxygen anaesthesia is mentioned and recommended, a development occurring since the previous edition.

In spite of the growing criticism of the cyanosis usually attendant on administration of nitrous oxide for major surgery, unsupported by curare or other adjuvants, the author makes a spirited defence of the harmlessness of cyanosis if intelligently employed, in the pages following page 196. In this, he will not find himself in accord with a great many recognized authorities on anaesthesia and pathology, but he makes a good case for his viewpoint.

Secondary saturation is still advocated as a harmless procedure despite the growing total of cases of brain damage following upon nitrous oxide-oxygen anaesthesia which have been recognized and reported by other investigators. Apart from a few typographical errors such as "directly" on page 158 and "ethylene" on page 162, the book is well printed and illustrated and gives the prospective reader the last word in nitrous oxide-oxygen technique.

Animal Cytology and Evolution. M. J. D. White, University College, London. 375 pp., illust. \$10.75. Cambridge University Press; Macmillan Company of Canada Limited, Toronto, 1945.

"The object of this book is to discuss the bearing of animal cytology upon the problem of the mechanism and processes of evolution. By cytology we mean nuclear cytology. . . ." Thus accurately the author defines his purpose. "All evolutionary phenomena can ultimately be interpreted in terms of gene-mutations and chromosomal rearrangements . . . on the one hand, and natural selection and the laws of probability on the other . . ." When, for example, two strains or varieties diverge sufficiently to become distinct species,



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there must be a critical point at which they cease to interbreed; this "isolation" which leads to "speciation" may be geographical, or physiological (separation of breeding seasons, for example), or cytological, that is, due to changes in genes or in chromosome structure which precludes the production of fertile hybrids. This exemplifies the type of problem discussed, with a wealth of data, in this book: the author points out that the various modes of "isolation" may arise gradually and contemporaneously, so that it is difficult to separate cause and effect, but his chief interest is in the cytological observations. "Each set or complement of chromosomes, characteristic of a particular species, may be regarded as a genetical system which, like a chemical compound, has certain fixed characteristics (mutation rates, recombination index, liability to spontaneous breakage and so on). These properties, which depend on its molecular composition and organization, must collectively determine the capacity of the whole system to undergo evolutionary change. To some extent, also, they may determine the direction of change." It will be seen that the author is dealing with some of the most fundamental problems of biology, and that he is not overawed by their immensity and complexity. That his approach to them is not a sterile one every reader will soon agree, and his readers will certainly include (despite the high cost of the volume) all geneticists and most zoologists. They will not, however, include many of those primarily interested in medicine and its ancillary sciences; the book is detailed and technical, and the data discussed are drawn largely from insects, with few references to vertebrates and scarcely any to man.

Aviation Neuro-Psychiatry. R. N. Ironside and I. R. C. Batchelor. 167 pp. \$2.50. E. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada, Toronto, 1945.

This is a very readable and interesting little book although it lacks sufficient description of the stress and strain of flying for the non-flying reader to obtain the proper background.

The various psychoneuroses are illustrated by case histories. The importance of removing most of the neurosis cases from flying stations is stressed, the neurosis clearing up when the individual is removed from the environmental stresses of flying. It was interesting to learn that it is a rare occurrence for a psychosis to develop for the first time during a flying career.

This would have been a most valuable book five years ago, but of course, we all learn by experience. It will be found of value to those interested in the maintenance of flying personnel in peace time.

Biological Actions of Sex Hormones. H. Burrows, C.B.E., Ph.D., F.R.C.S. 514 pp. 42s. Cambridge University Press, London; Macmillan Co. of Canada Ltd., Toronto, 1945.

Burrows, in his review of the biological work performed in the laboratory on the action of sex hormones, has succeeded in combining the authoritative reference with the interpretive discussion and the informative conclusion. The treatment of the subject matter of each chapter in this manner maintains the interest of the reader throughout the book.

By clear thinking and the use of straightforward, undeceptive language, the author has outlined fairly briefly the basic knowledge of biological action of hormones in laboratory animals which is essential to the student in medicine, philosophy, psychology or any of the sciences which deal with human relations, either social or economic. This knowledge is the result of repeated experiments by careful and well trained workers in biological laboratories. It is doubtful if further repetition of the experiments will lead to more definite conclusions than those presented in this work.

The foundation for further progress in both sex hormone research and clinical practice has been laid. No advance can be made without a thorough understanding of the information supplied by these basic experiments.

The obstetrician, the gynaecologist, the urologist and the internist, will find much instruction in the discussions on the effect of oestrogens and androgens on the development of the reproductive apparatus, and on the relation of these substances to that part of the endocrine system which maintains the functions of the body having to do with self preservation.

The enthusiast in these specialties will be restrained and the optometrist will find the horizon on the approach to the understanding of his specialty both broadened and brightened by a close study of this book.

Clinical Roentgenology of the Heart. Annals of Roentgenology, Volume XVIII. J. B. Schwedel, Associate Attending Physician, Medical Division, Adjunct Attending Physician, Department of Roentgenology, Montefiore Hospital, New York. 380 pp., illust. \$12.00. Paul B. Hoeber, Inc., Medical Book Department of Harper & Brothers, New York, 1946.

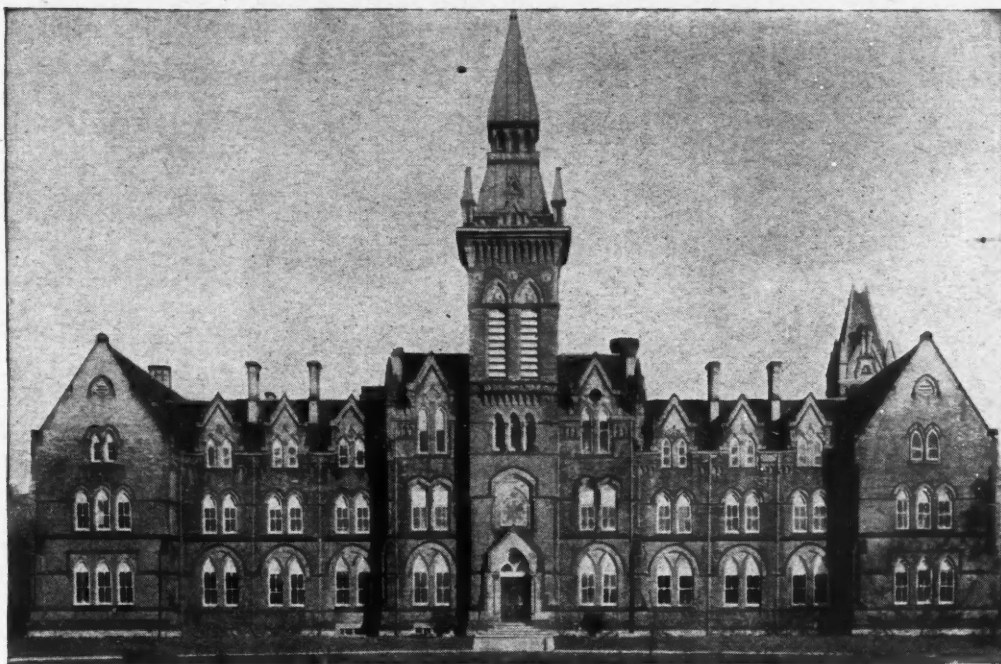
Few books have been published which are exclusively concerned with this important subject. The present one, based on an analysis of over 30,000 fluoroscopic and roentgenographic cardiac examinations (including correlation with 4,000 autopsies), is to be commended. The arrangement is systematic and very practical, the most noteworthy feature being the profusion of excellently reproduced roentgenograms throughout the book. This monograph is highly recommended to anyone interested in the practical aspects of cardiac roentgenology.

The Effect of Smallpox on the Destiny of the Amerindian. E. W. Stearn and A. E. Stearn. 153 pp. \$3.75. Bruce Humphries, Inc., Boston; Ryerson Press, Toronto. 1945.

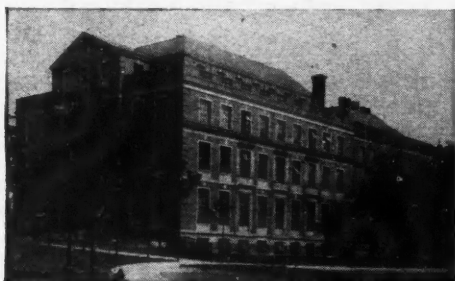
It probably will be very long before we can assume that the value of vaccination for smallpox is so well known as to need no further advocacy. Until that happy day when every arm (or leg) will automatically and periodically be bared for inoculation it will be wise to continue to recall the evil from which vaccination preserves us. Such a reminder is to be found in this account of the effect of smallpox on the Amerindian. No other single disease except perhaps malaria has more tragically coloured the history of a people than smallpox has done in the case of the Indians. The records are full enough to give us a very fair idea of the terrible mortality amongst them; probably the figures are very much below the actual losses. The success of vaccination in eventually controlling the disease is well brought out in this book. But the difficulties are also quite apparent, and readily account for the slowness with which the control was established. Smallpox amongst the Indians was so overwhelming that it almost overshadows in degree its effect amongst the more immunized European. But the picture must be looked at as a whole and this book is a valuable and interesting reminder of the lessons we ourselves may learn regarding the necessity for vaccination.

Electrotherapy and Light Therapy. R. Kovacs, Professor of Physical Therapy, New York Polyclinic Medical School and Hospital. 5th ed., 694 pp., illust. \$9.75. Lea & Febiger, Philadelphia; Macmillans, Toronto, 1945.

This book has five main divisions. Part one deals with fundamental electro-physics, and the generation, conversion, and distribution of electricity. Part two describes general electrotherapy and electro-diagnosis. In addition to the usual currents employed in medical electricity, this section contains chapters on electro-diagnosis, electro-surgery, and electrical injuries. Part three is devoted to light therapy, dealing with the physics of radiant energy, the use of infra-red and luminous radiations, heliotherapy and artificial ultra violet therapy. Part four consists of hydrotherapy and mechanotherapy, consisting of brief consideration of hydrotherapy, hypothermy, massage and exercise. Part



Spadina Crescent Building, providing administration, research laboratories and the production of Penicillin.



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CONNAUGHT MEDICAL RESEARCH LABORATORIES

In 1914 the preparation and distribution of essential public health biological and related products were undertaken in the University of Toronto in the Antitoxin Laboratory. In 1923 the greatly expanded undertakings were named Connaught Laboratories.

The work of the Laboratories is well known because of the widespread distribution of products. Throughout the years, however, research in preventive medicine has been a primary function. The number of research undertakings has kept pace with the growth of the Laboratories and to-day more than fifty studies are in progress.

To express the fundamental interest of the Connaught Laboratories in research, the Board of Governors of the University of Toronto has approved of the inclusion of the words "Medical Research" in the name of the Laboratories, which will now be known as "Connaught Medical Research Laboratories."

The preparation and distribution of biological and related products will be continued.

CONNAUGHT MEDICAL RESEARCH LABORATORIES
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five consists of applied physical therapy. A review of diseases of the various systems of the body is given, and the methods of physical therapy indicated are discussed. This section also includes chapters on physical therapy in office and institutional practice.

In this edition the main emphasis is placed on electrotherapy and light. The newer uses and methods of electronics, of electrodiagnosis, of ion transfer and of ultra violet radiation have been incorporated. The chapter on exercise has been enlarged, a new chapter on hypothermy has been added, and a revised glossary inserted.

This book is well written, not too complicated, and can be recommended to physicians and students of physical medicine.

Essential Hypertension. R. F. Herndon, M.D., F.A.C.P. 88 pp., illust. \$3.40. Charles C. Thomas Publishing Co., Springfield, Ill.; Ryerson Press, Toronto, 1946.

This small volume will be greatly appreciated by many physicians and medical students endeavouring to make their way through the voluminous literature of essential hypertension. It is not a review of the literature but rather is designed as an intelligent guide through the plethora of experimental evidence and speculation on one of medicine's foremost problems. The approach is in systematic sections pertaining to the normal regulation of blood pressure, followed by the etiology of hypertension, its physiology, pathology, clinical aspects, prognosis, diagnosis and treatment. A careful separation has been maintained between fact and theory and a well culled bibliography refers the reader to the pertinent articles.

There is free use of heavy print for important sentences which will be found helpful by some and perhaps annoying by others.

Essentials of Neuro-Psychiatry. D. M. Olkon. 310 pp., illust. \$5.15. Lea & Febiger, Philadelphia; Macmillans, Toronto, 1945.

In the short span of 300 pages, with 138 illustrations, the author attempts to cover "in abridged form" essentials of this vast subject. He states in the introduction "there is nothing in the entire presentation that can be termed especially original except for the pooling of the medical, biological, genetic, physiological, psychiatric, psychological, sociological experiences of the group" and makes it clear that the presentation is one that is impregnated with the principle of considering the individual as a whole. In this very respect, however, the book itself is disappointing.

There is much interesting detail in the book but it is not well organized. It is scarcely a book for the student who would, I am sure, not understand such things as the discussion of Adolph Meyer's Psychobiology or the discussion of Freud's Psychoanalysis, as it is here presented, unless he has already been familiar with the subject. The author is undoubtedly very capable of discussing such subjects as "capillary states in mental disease" and such psychological abnormalities as "transvestitism", but the space he devotes to this and other incidentals is out of all proportion to more important matters. The advanced student will find some interesting anecdote and reference.

Experimental Catatonia. H. H. DeJong. 225 pp., illust. \$4.40. Williams & Wilkins, Co., Baltimore; University of Toronto Press, Toronto, 1945.

This is a presentation of DeJong's experimental work on catatonia, carried on for many years, with his associates, first in Holland and since 1940 in the United States.

The author stresses that catatonia is a syndrome, a reaction form of the Central Nervous System, whether

it occurs in man or in an experimental animal and that it may have a varied causation. In the second section of the book, some evidence is presented, very unconvincing evidence, that catatonic schizophrenia may be related to disturbances of liver function.

The study does not reveal any correlation between catatonic symptoms and any particular brain centres or structures, and as a result it adds little or nothing to our understanding of cerebral physiology, and leaves the reader disappointed. On reading over the description of the behaviour of the experimental animals one feels that the concept of "Experimental Catatonia" as used here is a very loose one including a wide variety of reactions. In fact some of the reactions described in animals may be no more than distantly analogous to human catatonia.

This monograph will be of interest chiefly to the psychiatrists and experimental psychologists. It represents a life time of research along one particular line and is a contribution, however tentative, to the understanding of abnormal human behaviour.

Fractures of the Jaws. R. H. Ivy and L. Curtis. 3rd ed., 174 pp., illust. \$5.15. Lea & Febiger, Philadelphia; Macmillans, Toronto, 1945.

This book has for a number of years been the standard text on jaw injuries. The new edition continues to be just that. It deals in a practical manner with tried and tested methods leaving more controversial procedures to a mere mention.

The original text has been expanded and forty new illustrations appear. This includes sections on split acrylic resin splints, methods of multiple eyelet wiring and Risdon's cable arch. The methods of double pin skeletal fixation are dealt with adequately and in their proper perspective. Federspiel's and Adam's procedures in treatment of upper maxillary fractures are considered. The paragraph on fractures in children has been expanded but still does not deal adequately with the subject. The chapter on bone grafting has not been altered from the old edition and no mention is made of chip bone grafts, a procedure introduced by Mowlem in 1941 and well tested in the present war surgery of the jaws.

On the whole, the book deals well with this rather special branch of surgery and is highly recommended to the surgeon, oral surgeon and dental surgeon.

General and Plastic Surgery. J. E. Sheehan, Professor of Plastic Reporative Surgery, New York Polytechnic Medical School and Hospital. 345 pp., illust. \$6.75. P. H. Hoeber, Inc., New York, 1945.

One cannot but be amazed that this little volume should in its 345 pages endeavour to roll up an encyclopaedia of general, plastic and war surgery. It is largely a collection of diagrammatic illustrations from the works of a number of authors who have been intimately connected with war surgery. Of the 496 illustrations about 159 are from works of Hamilton Bailey and about 188 from the works of others, while the remaining 149 seem to stem from the author, many of these from his previous works. The volume is not well-apportioned, Chapter II dealing with Wound Excision and Chapter XV, the second last chapter dealing with The Healing of Wounds. To illustrate the incomplete and sketchy nature of the book, wounds of the cranium, brain, spine and cord are treated, with the help of Hamilton Bailey and a *Lancet* article, in the 16 pages of Chapter IX; wounds of the chest are handled by Bailey, Tudor Edwards and the author in the brief 11 pages of Chapter X; then the author skips glibly along with the help of Bailey to treat wounds of the abdomen, and pelvis including the penis in Chapter XI's 33 pages. The print is clear and the illustrations, of which there are many, are good, but to give credit where credit is due the authorship might well be attributed to Bailey, Sheehan *et al.*